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Saint Apollonia the Patroness of Toothache
Painted by Carlo Dolci (1616-1681).
Original at the Galleria Corsini in Rome.

FOLKLORE OF THE TEETH

BY

LEO KANNER, M.D.

YANKTON STATE HOSPITAL
YANKTON, SOUTH DAKOTA

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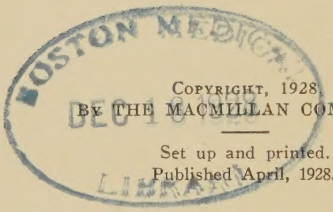

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SET UP BY BROWN BROTHERS LINOTYPERS
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TO

JUNE,

MY WIFE AND COMRADE,

THIS BOOK IS DEDICATED IN LOVE AND ADMIRATION

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INTRODUCTION

It has been one of the noblest endeavors of scientific progress of recent days to discredit superstition, to free the human mind from the oppressing clasp of mystical fears and apprehensions, to liberate the atmosphere from the fancied presence of spirits and ghosts, of demons and devils, projected into existence by the highly creative imagination of our bewildered ancestors. The natural interpretation by physics and chemistry, biology and medicine of hitherto inexplicable phenomena has withdrawn the foundation from under the huge construction of magic beliefs built up in the course of millennia, taken for supreme revelations, cherished as imperturbable convictions. The time of witchcraft and totemism, mythology and divination, at least in the civilized sections of our globe, has gone forever.

Yet superstition, which is one of the various outlets of our symbolic productivity, is by no means merely the result of man's ignorance and helplessness. Symbolism is as natural and physiological a function of human life as is our heartbeat or our digestion, independent of our volition and inseparable from our mode of thinking. Symbolism, so all-powerful in the activities of our backward savage brothers and the omnipotent mother of all poetry and art, is the source and a dominating factor of our language, the creator of our dreams and, regulating our social conventions, a guide of our conduct. Hence, symbolism is the driving force in all that we call folklore, a conception which includes the traditional customs, beliefs, tales, proverbs, popular songs and usages of all people inhabiting our planet. Since these customs and manners comprise all thinkable relations of man to his environment and to the universe, their study is

an indispensable clue to the understanding of mankind's thought and behavior.

It is to be expected that the human body, being the very center of every individual's interest and curiosity, should occupy a vast dominion in the land of folklore. Numerous volumes, as a matter of fact, could be filled with accounts of popular beliefs and customs dealing with our physical structure as a whole, as well as with its single organs; large libraries could be put up of such volumes, without ever exhausting the subject. Each one of the many races, nations, tribes and tribelets has been for thousands of years, and still is, immensely prolific of folkloristic productions relating to the eye, the ear, the organs of procreation, the hands, the head, the heart, and practically every member of the body of which the primitive mind has knowledge.

Of all these organs there is perhaps none that is surrounded by such an enormous wealth of folklore as are the teeth.

It is a combination of several factors to which the dental apparatus owes its excessive popularity. Every other organ is present at the time of birth; the teeth "grow" into existence long after the child has come into this world. No other organ can be restored after it has been lost; the teeth come back, and that in larger number, after they have once left the oral cavity. They alone can be removed without material damage to the organism and without leaving a too conspicuous deformity. In the colored races, their whiteness instantly attracts the onlooker's attention; due to their hardness they may be preserved long after their owner's death; their accessibility renders them a welcome object of the primitive nations' beautifying devices. The sensation of toothache is known and dreaded wherever human beings live.

I have attempted in this book to give an outline of the folklore of the teeth, introducing it at the same time as a new branch of dental science, just as the folklore of medicine

is, or should by all means be, considered as a branch of medical science. I have for many years collected the material from literature, from museums, from oral communications, through travels and from every other possible source. Yet I still believe that by continued endeavors it could be augmented ad libitum, if not ad infinitum. It is, of course, never possible to make a folkloristic study complete. To do so, it would be necessary to spend more than one man's lifetime traveling the inhabited earth over, observing, inquiring, listening, studying the folkways, the manners and customs, the language of each community of this world. By including not only these customs but also the superstitions and traditions, proverbs, folk-songs, legends, charms, invocations, the pathologic and therapeutic beliefs and measures as centered upon the teeth, their development, their number and position, their diseases, their loss, their use outside of the oral cavity and the various forms of their mutilation, I believe that I have treated the subject as exhaustively as it can be presented in such limited space.

I wish to emphasize that I look upon this book as a rudiment, or as a skeleton around which a public with aroused interest in its contents will gradually build up a real living body.

PART I

NUMBER, SHAPE AND ERUPTION

FOLKLORE OF THE TEETH

CHAPTER I

NUMBER, POSITION AND TIME OF ERUPTION

It is not to be wondered at in the least that people of average education know very little of anatomy, and that even the general composition of the body is a closed book to so many of our contemporaries. The world-famous admonition inscribed above the entrance to the temple of Apollo at Delphi, "Know Thyself," the starting point of all human scientific and transcendental endeavor, has, as a matter of course, absolutely failed to impress itself upon those of our fellow men who never had the opportunity, nor the time, nor, in many instances, the interest to devote themselves to the study of their own corporeal beings. It should not therefore surprise us at all if Jim or Jack exhibits his ignorance in regard to the number of his ribs or of his vertebræ. But one would expect that at least those organs which, far from being hidden in the impenetrable darkness of the visceral cavities, are perceptible to our senses, might have engraved their pictures in the brain and might be remembered with all their visible qualities and details.

Unfortunately, this is not the case. We not infrequently meet with individuals of sometimes more than fair intelligence who become embarrassed when questioned as to how many teeth they have. We agree fully with Preuss who, in his valuable book on Biblic-Talmudical medicine, makes the remark that one can meet to-day more than one man who thinks himself very wise who has no idea as to the number of his teeth. In a most beautiful little anecdote the

Talmud tells of one pseudoscientist who, although counting diligently the planets of the sky, did not know how many teeth there were in his oral cavity. This man, a sectarian, bragged one day about his profound knowledge of astronomy in the presence of the noted Rabbi Gamaliel and went on to say: "The number of the stars is well known to me." To which the sage replied smilingly: "Tell me how many teeth you have." The boaster, confused, put his hand in his mouth and began to count them. Then Rabbi Gamaliel exclaimed: "You do not even know what you have in your own mouth, how in the world do you expect to know what there is in the sky!"

To be informed about the number of one's teeth, in the language of the ancient Hebrews, used to be identical with a true estimate of one's financial affairs. This enables us to understand the meaning of the proverbial warning against the inhabitants of Naresh, who had the reputation of being incorrigible thieves and cheats: "If a man of Naresh kissed you, then count your molars over."

In early times of history, not only were the uneducated laymen very often ignorant and mistaken about the number of the teeth, but it is with greatest astonishment that we read the erroneous statement of that versatile truth-lover and truth-seeker, Aristotle, who believed that a man has more teeth than a woman.

Kuvera, the Indian God of Riches, according to Mahabharata, is a hideous man who has three legs and only eight teeth.

Rigord, an historian of the thirteenth century, tells that when Chosroes, the Persian, carried away the true cross discovered by Saint Helena, the number of teeth in the human race was reduced. Before that time, Christians were furnished with thirty, and in some cases with thirty-two teeth, but since then no human being has had more than twenty-three teeth.

At the same time the ancient writers, some of whom

knew so little of the normal set of teeth that even their number was not familiar to them, have reported several cases of either an entire congenital *lack of teeth,* or of such abnormalities as the presence of a third row of teeth in the oral cavity. Not one of the authors had ever seen with his own eyes any of the odd malformations that are described; they did not supply us with "case histories" in the modern sense of the word. They only gave us reproductions of popular beliefs, citing from hearsay, from traditions, myths, folktales and legends. Thus Prusias, the son of the King of Bithynia of the same name, is said to have gone through life with not a single tooth in his mouth; instead of the upper row of teeth he had a bony ledge extending over the whole of the alveolar process *(unum os æqualiter extentum),* which was very well capable of masticating and which formed a becoming and by no means ugly substitute for the lacking teeth. Valerius Maximus, who has furnished us with a report of this case in his booklet on memorable sayings and facts, begins his description with the amazing question: "Why! Could one believe that such varieties of nature could have existed in the human body?" According to Januarius Nepotianus, the possessor of the anomaly was not Prusias but Pausanias, and he also ascribed it to another ruler, King Pyrrhus of Epirus.

Similarly, we learn from Herodotus that after the battle of Marathon the skull of a soldier was found, the upper jaw of which contained but one single tooth which extended from one end of the bone to the other. Moeller, who has devoted special study to the medical statements of the "Father of History," admits that he is not able to explain this peculiarity of a jawbone, "the teeth of which consisted of one piece." He assumes that the jawbone did not come from a man but from some animal. Others believed that, as a result of neglect and because of a personal predisposition, the teeth were so thoroughly embedded in a crust of

tartar that nothing could be seen of the interspaces between the single teeth, and that therefore they appeared as one undivided structure. Buck, speaking of the teeth of the Swabians, says that there are seen some jaws, the teeth of which have seemingly grown together by the apposition of tartar, and impress one as forming a single piece.

In the cemetery of Gayton-le-Marsh, county of Lincoln, England, there is a tombstone, the inscription of which states that here rests "Elizabeth Cook, a poor woman who *never had a tooth in her mouth,*" and that she was buried June 11, 1798.

It is very strange that supernumerary teeth, which do not occur very frequently, it is true, but which have been recorded often enough and are undoubted scientific facts, were never dealt with in folklore at all. On the other hand, mythology and fancy were not satisfied with the possible addition of one or two teeth to the normal set; they invented impossible monstrosities with *double or threefold rows of teeth.* According to Valerius Maximus, Dripetine, the daughter of King Mithridates of Pontus and Queen Laodice, who accompanied her father on his flight from Pompey, was affected with such a deformity *(duplici ordine dentium deformis).* The old Greek myth that the hero and half-god Hercules was supplied with a threefold row of teeth, finds its analogy in the account of a traveler in 1560, who pretends that he saw in Venice the monstrous face of a man with three rows of teeth. It may be mentioned in this connection that of the horrible dragon, defeated and killed by Cadmus, the founder of Thebes, Ovid says:

> "Igne micant oculi, corpus tumet omne venenis,
> Tres vibrant linguae, *triplici stant ordine dentes.*"

As the reader has probably noticed, almost all the popular beliefs concerned with the number of the teeth were quoted from the past centuries. The present time does not give us any noteworthy data in this respect, inasmuch as the myth formation has suffered a great restriction in these

days of railways and radio. But the same people to whom old traditions and legends now mean nothing more than what they really are, productions of a vivid fancy "correcting" and enlivening history, still adhere to a great number of superstitions from which hardly anything seems to be excepted. Because the normal occurs in millions of examples and has thus become common and uninteresting, folklore dwells with predilection upon the abnormal, extraordinary phenomena. Hence, it is easily understood that disorders in the position of the teeth within the oral cavity form a welcome subject for folkloristic interpretations.

In many parts of Germany, in the province of Brandenburg, in Silesia, Hesse, Frankenwald and in the Tyrol, it is believed that the one whose *teeth stand far apart* is destined to travel far. The same opinion is prevalent in Gloucestershire, England; there, too, the saying goes that if the little projection in the upper gum (between the upper incisors, below the frenum) is prominent, the possessor of the anomaly will leave his home country for a long and distant journey. Correspondingly, a child whose teeth stand close together is bound to remain at home all of his life, a superstition which is recorded from Germany by Grimm, who unfortunately fails to give the exact origin of this belief. In Berne, Switzerland, if a child's teeth grow so that broad spaces are left between them, it is believed that he will become a great traveler. If there is a large space between the two upper middle incisors, he will be a good singer.

The Italian whose teeth stand far apart is a lucky man; but if they grow close together he is doomed to have a disastrous life.

In the United States of America teeth standing apart indicate that their possessor will undertake long travels in foreign countries. But—

> If your teeth lie one on the other,
> You will always live with your mother.

In Canada there is a superstition that he whose front teeth are so far apart that a quarter can be placed between them, will be very rich.

Among the Langobardian names cited by Bruckner we find one Petrus Zanvidus (gap between the teeth), which shows that such a gap was considered important enough to be used for a man's surname.

In Palestine the people take it for granted that a person who has blue eyes and teeth far apart possesses the power of the "evil eye." The danger is increased if the characteristics are found in a beardless man. The inhabitants of Palestine, according to Stern, as soon as they see such an individual, say, in defense from the "evil eye," an Arabian prayer which in English reads thus: "Allah, protect us from a beardless man who has blue eyes and teeth that stand far apart." In Alsace, those who are supposed to have the gift of the evil eye are believed to have no teeth at all; in Austria they have three unusually long teeth which make them easily known as witches.

While these folkloristic beliefs in regard to physiognomy are readily recognized as superstitions, there lived in Paris in the year 1865 a kind of "odontological physiognomist" who seriously taught that the characteristic traits of men could be concluded with infallible certainty from the position of the teeth. As Lavater interpreted the character from the lineaments of the face, Gall from the prominence of the skull, Desbarolles from the lines of the palm, and others from the shape of the feet, so our Parisian "professor" found the teeth to be the true and never deceiving indicators of the human character. According to his teachings, teeth which stand vertically in good order are a sign of orderliness and magnanimity. Teeth which deviate from the regular position and approach the lips point to a passion for imitation and mockery. Those which tend backward toward the palate indicate the instinct and impulse to do wrong. Broad and round teeth are found in men who

are brave and sincere. Long, pointed teeth which stand far apart are a sign of vulgarity and baseness.

The "professor" had at least a part of his wisdom from the German belief that small, white, sharp teeth which do not stand too close together are a sign of wit, good nature, and inflexible honesty, at the same time also of poor health and short duration of life. Irregular teeth mean fickleness. Keen and sharp but broad and strong teeth belong to villains, traitors, and people of a jealous and envious disposition. Yellow teeth indicate insanity. Large front teeth are believed to be a characteristic of great sensuality, bestiality, and prophesy long life. In Styria yellowish teeth betray an unhealthy individual, bluish transparence of the upper incisors are taken as a symptom of consumption, the possessor of black teeth indulges in tobacco and sweets. In Chestertown, Maryland, they tell you not to trust people with pointed teeth.

The position of the teeth was, as we see, not only considered as a physiognomic oracle, but as a prophecy which categorically predicts the future of man. Almost innumerable are the opinions and customs scattered all over the civilized and uncivilized world attached to *the time and the succession of the eruption of the teeth.* Here, too, any deviations from the norm, any exceptions to the rule, are thought of as being of immense importance for the individual, for his family and sometimes even for the whole community in which he lives. This is the place to emphasize admiringly that where the abnormal phenomena of tooth eruption are noticed immediately and dealt with as having enormous significance, there the regular time and sequence must naturally be well known. As a matter of fact, some of the savages are better informed about this subject than are most of our high-school students. That the cutting of teeth as such is regarded everywhere as one of the most momentous periods of life will be shown in a later chapter. Here we shall confine ourselves to the

description of the many superstitions and reactions that were built up around the nucleus of the time of tooth eruption.

Too early teething is generally considered as a precursor of premature senility. There is a German and also an Italian proverb that says: "The one whose teeth grow early, will early sink into the grave." Analogously, late dentition is identified with living to be very old. This conception, too, has found expression in a maxim heard both in Germany and in Italy: "If the teeth appear late, one will survive the death of all relatives." The people in northern England say: "Soon teeth, soon toes," indicating that early dentition of a child is soon followed by the birth of another child.

In very rare cases teething begins as early as during the embryonal life of the child, who then comes into the world with one or (very seldom) two teeth already present in the oral cavity. As to the superstitious all infants who show some abnormality of the structure or development of the body appear stamped with an inevitable fate, so to the children born with teeth an out of the ordinary, by a few nations an exceedingly happy, by most of them a disastrous, life is predicted. In those countries of Europe and Asia where they are not taken as future celebrities, as is the case particularly with the Latin nations, they are generally the recipients of distrust and ill-treatment; in Africa, they were, and still are treated with barbarous cruelty in that they are deprived of their lives immediately after birth.

For a child to bring a tooth with him from the intrauterine existence was regarded as so important a circumstance by the old Romans that they gave him for all his life an epithet alluding to it. The tribune Lucius Sicinius (450 B.C.) and the famous hero and consul Manius Curius, who lived about two hundred years later, are said to owe their surnames "Dentatus" to the fact that one or several of their deciduous teeth had come through before they were born.

To other great men also the same anomaly has been ascribed, probably not always strictly following the historical truth. Thus we read in the biographies of Louis Quatorze of France that this celebrated king was born with three lower incisors, which made life quite hard for his poor nurses. The Roman Papirius Carbo, the noted Frenchmen, Mirabeau, Mazarin, and the anatomist Broca seem, too, to confirm the old popular opinion prevalent in Italy and in France, that a splendid future awaits children with embryonal teeth. To some extent, this is true also in the case of Richard III, the last Plantagenet, of whom Shakespeare says:

> That dog, that had his teeth before his eyes,
> To worry lambs, and lap their gentle blood.

That means that he possessed some teeth before his eyes had opened, which occurs immediately after entrance into the world.

In Shakespeare's "King Henry VI," Part III, Act V, Scene 6, Gloster says of himself:

> The midwife wonder'd, and the women cried,
> "Oh, Jesus bless us, he is born with teeth!"
> And so I was; which plainly signified
> That I should snarl, and bite, and play the dog.

Lapping and sucking of blood is a property attributed to the vampires. There is, indeed, another widespread superstition, found particularly among the Slavonian and the Ural-Altaic tribes that children with embryonal teeth become sorcerers or witches. In Bohemia and Moravia such an infant is called "drud" or "morous" or, in the case of a girl, "drude" or "mora." The teeth themselves, it is believed, will soon fall out and will never be replaced either by deciduous or by permanent teeth, thus leaving a disfiguring gap. The Lower Wends in Lausitz name children born with teeth, in the same sense, "murava"; the Kasubians in the region of the lower Vistula speak of them as "ohyns," beings who resemble real men in everything, in

their birth, their course of life and death, but who are none the less dangerous, vampire-like spirits who remain on earth for only a short period of time, and who after their death gnaw their own flesh from their bones and leave their graves in those full moon nights that follow either Tuesdays or Fridays in order to suck out the blood of their nearest relatives when they are asleep, to pull them into the grave and there to consume them. If the teeth of the new-born are taken out at once, then the bad weapons are removed, the danger averted, and the child from then on becomes a normal mortal and will be harmless after death.

The country people in Hungary think that children who bring teeth into the world are changelings, "táltos," who shortly after their birth were exchanged by witches for the real children stolen by them; therefore as offspring of witches they are exposed to ill-treatment and general contempt. They can, however, arrive at happiness and even at great power, if at the age of seven years they succeed in saving the tooth in their fight with the older sorcerers. The exchange can be prevented by putting a knife into a slip of garlic and placing the whole under the pillow of a woman in childbed.

Jones and Kropf mention the fact that in England, too, infants born with teeth arouse suspicion. Such a child is spoken of as "a hard-bitten one."

Of the Asiatic peoples, according to Beguelin, the Mongolians consider a baby that comes into existence with a tooth in his mouth as a being of ill-omen. This belief prevails especially among the Ainos, whose state of civilization is exceedingly low.

Much worse is the fate of such children among some negro tribes in Africa. Among the Basutos, the women assisting at childbirth mercilessly kill each baby born with teeth (or with any other deformity) by drowning it in a pot of water. The Antakarana in Madagascar, before the acceptance of Islam, used to expose these children, whom

they called "maherianda" (orphans). A man of the family's acquaintance took the little one into the forest, dropped the milky juice of a certain plant on its breast and then surrendered it to the jaws of the wild beasts or to starvation. In later times a milder procedure was chosen; after having exposed the child "according to the rules," a woman brought it back and kept it in her place, but the parents were not permitted to ever take it back, nor should its ancestry ever be made known.

The Bantu negroes on the lower Congo ascribe these teeth to the influence of the fetish, "Udembo."

Among the Bonny people in West Africa the custom of destroying children who had the misfortune to be born with teeth was, and is, still observed.

Besides the time of eruption, the succession of the perforating teeth is dealt with quite frequently in folklore. In a large majority of cases, the first teeth to come through are the lower incisors. There is, in the opinion of a great number of peoples, an immense danger if the upper frontal teeth appear first.

Of the European countries, Bavaria, Bohemia and Silesia are recorded as habitats of this strange superstition: If the lower teeth come first, the baby will grow up, but it will not survive its deciduous teeth if the upper incisors come first. Another variety of the belief met with in Bohemia gives very little hope to a child, no matter what the sequence of eruption; if the first tooth is in the lower jaw, the child digs its own grave; if it is in the upper jaw, the child will die soon. In Grünberg, Silesia, there is a proverb in reference to the order in the cutting of teeth, "Teething high, buried deep." In other Silesian places, on the contrary, a happy future is predicted for such an infant.

The Hindus say that a child whose upper teeth appear first, brings great danger to the mother's brother.

The appearance of the upper incisors before the lower is also thought to be a disastrous omen by the Arabians of

Zanzibar. They have the baby sit in front of them and read the Koran to it, then they move its little head, making it nod; by means of this ceremony they make it swear by their Holy Book that it will never do any harm to its family.

Very common is the belief in the dangerousness of such children among the eastern Bantu tribes in Africa. In Ugoro and Uganda, if the upper teeth come through before the lower, the mbandua (sorcerer) is called, who protects the baby and the baby's family by the performance of certain dances. Such a child was even cruelly killed by the Wanyika, Waseguha and Wakikuyu. The Wasaramo, too, do away with a child who is unlucky enough to have the upper teeth come through first. So do the Malapa in Transvaal, the Wasambara and Wakilindi in the formerly German part of East Africa; there a child is also killed if a lateral tooth appears first instead of a frontal, and the execution is performed by the village mayor.

In the region called Mkulwe, which is situated in the same zone, such children are called "kinkula." A kinkula is both unlucky and dangerous; it is his destiny to ruin the whole family if he is allowed to grow up. Therefore, in former times, he was pitilessly murdered at once by some old woman. The authorities suspect that they still do it in secret to-day.

When Livingstone in 1859 was among the Makolola, south of Lake Nyassa, one of Sekelerus wives would not permit her child, whose upper teeth had come through first, to be killed on account of that. Few women, says Livingstone, had the courage to defy public opinion as that woman did.

Velten reports the same conflict between tradition and parental love in the Swahili. They, too, used to kill the children in whom eruption took place in the "wrong" succession. Some of them say: "Though I know that it will bring me trouble and worry, I cannot abandon my own flesh and blood; I shall raise it." But they have little pleasure

in it. Such a child is called "kibi" (disastrous), but later it receives another name like the other children, too. There are people who are afraid to shake hands with such a child lest it might make them ill or even cause their death.

The Basutos, not being influenced by the mild effects of civilization, still murder each child presenting the upper incisors first. The same is reported from a few Central African tribes.

Speaking of the anomalies of eruption, we must mention further the belief that the cutting of the deciduous teeth is followed occasionally by a third dentition which may appear in very old age. "Third dendition," described quite often by the older writers on dentistry, was discredited for some time by Scheff and by Busch, who denied its occurrence emphatically and declared that whenever one had one or more teeth come through in older age it was a delayed second dentition. But since in more modern time Montigel and Kerstig have been able to prove roentgenologically the rightfulness of the older authors' conception and have found at least two undoubted cases of third dentition, we have to believe in its existence.

Folklore usually states the fact that some old man or some old woman had to undergo teething anew, without attaching any particular importance to it. That lost teeth can grow again, was believed by the "scientific" physician and dentist, John Gaddesden of Oxford (1400-1450), who is authority for the statement "that the brains of a hare rubbed on the gums not only felicitate dentition but will make teeth grow again where they have been lost."

The Talmud tells of a man by the name of Rabbi Haggai, who was rewarded by the Lord for his laudable endeavors at the funeral of the saint Rabbi Huna, in that at the age of eighty a perfectly new set of teeth came through on both his jaws.

From the teething at eighty to the growth of teeth after death is only a little step. Henricus Kormannus pub-

lished in 1694 a book on the miracles of the deceased, in which he tells that at the time of the Emperor Tiberius several bodies were exhumed, the teeth of which had grown in their graves to such a length that they were longer than a man's foot.

An old Jewish legend is retold in the Midrash: "Said Og, the king of Bashan: The camp of Israel, how large is it?—Three miles.—I shall go and pull out a mountain having the circumference of three miles and throw it upon them and kill them.—He went and pulled out a mountain having the circumference of three miles and put it on top of his head. The Lord, praised be He, sent ants to the mountain and had them eat a big hole in it, and it sank down to his neck. He tried to push it off,—there grew his teeth longer and longer, hither and thither, and he could not push it off." The growing teeth pierced into the mountain so that he could not take it off and throw it upon the camp of Israel.

Genesis 25, 25, describes the birth of Esau with these words: "And the first came out red, all over like an hairy garment; and they called his name Esau." From this verse the Talmud concluded that Esau's teeth were covered with hair, too. Buxtorf, in his *"Lexicon Chaldaicum, talmudicum et rabbinicum,"* says of Esau: *"Totus fuit obductus pilis: caput, barba, dentes et molares."* (He was all covered with hair: head, beard, teeth and molars.) It is possible that the German phrase, "He has hair on his teeth," indicating a wise and energetic man, may have its origin in the hairy teeth of Esau. According to others, it simply states that he who is old enough to have his teeth surrounded by whiskers and beard, or has "hair on his teeth," may be considered as an experienced man.

According to the Talmud, the teeth, nails and hair are the only organs which, after being separated from the body, remain imperishable.

CHAPTER II

THE GOLDEN TOOTH

The material of which teeth are made is known to the people as osseous, or as a substance similar to, or harder than, bone. Folklore, however, knows of a few exceptions to this rule.

If, according to Genesis 33, 4, Esau, meeting his brother Jacob, put his arm around his neck and kissed him, the Midrash, a collection of Jewish exegetic treatises on the Old Testament, dating from the fourth to the twelfth century, cannot believe that the notorious evil-doer should do such a nice thing without having some mischievous intention in his wicked mind. Esau, far from loving his brother, instead of kissing him, really meant to bite him in the neck and to kill him by injuring one of the vital arteries. But the Lord who knows all and sees all was watching him. As soon as he tried to sink his teeth into the patriarch's neck, they were *transformed into wax* and, as others say, the endangered neck became as hard as ivory. As a result, the softened teeth were broken, for "Thou hast broken the teeth of the ungodly," says the psalmist.

In four instances we hear of teeth which were believed to consist originally of real gold.

I. *Heimdal Gullintanni.* The Norse god Heimdal, the heavenly watchman, son of Odin, was the possessor of a whole set of golden teeth. As such, he was given the surname of "Gullintanni."

II. *Harold Hildetand.* Harold, King of Denmark, was the son of Rörik Slyngebaud and Audur, daughter of Ivar Vidfadme. His surname of Hildetand or Golden Teeth

is thus accounted for: Hildetanni cognomen obtinuit ab Hilde, quae Dea belli prohibetur, seu septentrionis Bellona, *et dentibus aureis.* He died in 735 A. D. (I do not know just why another Harold of Denmark, 941-991, was given the surname of Blaatand or Blue Teeth.)

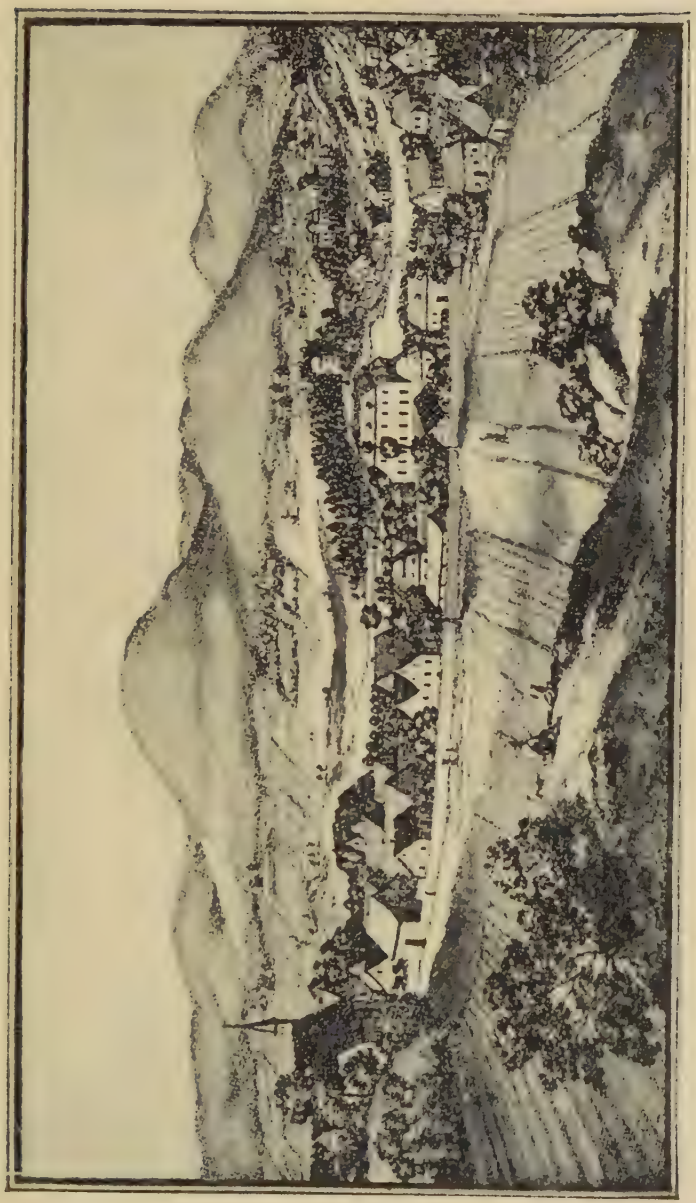
III. *The Golden Tooth of the Silesian Boy.* Anno Domini 1593, eight days before Easter, in the village of Weigelsdorf near Reichenbach in Silesia, a seven-year-old boy and a little girl of the same age were conversing in school. When the boy, whose name was Christoph Müller, happened to open his mouth, his companion was surprised by the discovery of a bright shine that radiated directly from the boy's mouth. The source of the shine was examined and it was found that on the left side of the lower jaw there had grown a golden molar tooth. That was at a time when dentistry knew nothing yet of the preparation of golden crowns.

The rumor of the golden molar instantly spread all over the country. People came to Weigelsdorf from far and near to admire the unheard-of miracle. The Dukes of Liegnitz, Brieg and Münsterberg, the Bishop Andreas of Neisse, and many members of the nobility were among the visitors.

Jacob Horst, professor of medicine at the Julius University of Helmstedt, was at that time (in 1594) on a business trip in Schweidnitz, Silesia, to sell a house that belonged to him. Friedrich von Gelhorn, the owner of Weigelsdorf, who consulted him in regard to his sick son, made him acquainted with the curiosity which was considered as one of the world's greatest wonders. Henceforth, all of Horst's energy was devoted to the study and to the interpretation of the golden tooth of the Silesian boy.

Thus, a new branch of the medical science was founded, the "*chrysodontoscopia,*" the science of the golden tooth. Bruck, in his excellent monograph, gives a full account of its development and of its end.

Christoph, according to Horst's description, was a boy of



Village Weigelsdorf

The Home of the Silesian Boy with the Golden Tooth.

a "warm and dry nature," "of a slender figure but fine shape; he had a skilful head and was very religious and inclined to learn quite well." The tooth in question was the last molar on the left lower row of teeth, very firm and strong; the gold was glimmering and glittering. The tooth was thicker than molars usually are, but the length, height and form were the same. It was surrounded by beautiful, red, fresh and healthy gums all around. The other teeth were all present, with the exception of the one next to the golden tooth; this was "undoubtedly removed by God and Nature so that so miraculous a building as the golden tooth could be looked at better."

Horst first attempted several comparatively simple interpretations of the miracle but was compelled to reject them after short consideration. The thought came to his mind that the whole affair might be only a cunning fake, the motive of which was either the desire to make money or ostentatiousness. Yet a thorough investigation with Lapis Lydius, a touchstone used to test the fineness of gold alloys, which was conducted by "several experienced barbers" and by Horst himself, proved that the material of the tooth was real gold, having the properties and composition of Rhenish or even of the purer Hungarian gold. And as to ostentatiousness, the boy's family was notoriously very poor and, if such a thing were possible at all, could not have afforded to pay for so costly a piece of jewelry.

One might also have thought (it was in 1594!) of "marking the child." There was, and still is, a superstition that if a pregnant woman watches or imagines a thing intensively, then the baby will have some resemblance to, or a birthmark reminding of, the observed or fancied subject. Thus, the boy's mother, when pregnant with Christoph, might have thought much of gold and riches and through her dreams imparted the golden tooth to her child. On the other hand, never before had a dental anomaly been

known as such a "mark," and, besides, the boy was not born with it as is expected of a regular birthmark, but it erupted as late as in the seventh year.

It was possible, too, that the gold contents of the Silesian mountains and brooks had something to do with the origin of the golden tooth. The water that Christoph drank and the roots and vegetables he ate might have been soaked with the gold-containing juices, and so the boy, who apparently had a special predisposition to attract the gold, became the possessor of the golden tooth. As to each metal a particular planet was "appropriated," the sky and the constellation must have had an influence upon the formation of the marvelous tooth. When the lad, Christoph Müller, was born, Horst speculates, that is on December 22, 1585, the Sun was in the conjunction with Saturn, Mars, Venus, and Luna in the sign of Aries. This being the beginning of the fiery trigon, *Trigonus igneus,* which always was of great significance in history, "why then should the golden tooth with such a great conjunction at the beginning not have some particular meaning"?

Horst believed that he had found the meaning. After all the horrible happenings of the sixteenth century (the invasion of Europe by the Turks), the golden tooth was a "comforting omen of God the Merciful." It meant the approach of the Golden Age. As a solace for the poor, it was in itself a proof that the Lord could make gold of a bone.

Furthermore, the golden tooth predicted good luck to His Imperial Majesty, Rudolph II, the head of the Holy Roman-German Empire. As in the dream of Nebuchadnezzar, interpreted by Daniel, the golden head of the bust was a symbol of the Babylonian Empire, so the tooth was identical with the greatest and most powerful Christian country which, at that time, suffered much from the invasion of the aggressive Turkish neighbor. The Kaiser, who always was in financial difficulties, had a hard time bringing

together and supporting an army against the Mohammedan enemies of Christianity. Now, the eruption of the golden molar meant an entire change in the course of history. It prophesied the complete destruction of the Turkish power, and at about the end of the sixteenth century, says Horst, "Turk and Tartar and all the vermin of the same category might be swept away and radically exterminated." Then, the "golden empire of peace" will come, which, according to the prophet Daniel, shall precede the end of the world and which is infallibly announced by the golden tooth.

All this, deduced by Horst in his writings which were dedicated to Kaiser Rudolph II, and to all the sovereigns of the Holy Roman Empire, and in a lecture made in the University of Helmstedt January 13, 1595, became the subject of serious discussions and controversies in the following years. It would lead too far to reproduce the contents of all the pamphlets, letters, poems and lectures existing on the golden tooth of the Silesian boy. One interested in the details will find a complete bibliography at the end of this book. He may be referred, too, to the precise description given by Bruck, whose monograph forms a delightful contribution to the cultural history of the vanishing Middle Ages.

It is characteristic for that time that Horst's absurd deductions were given so much attention in the scientific world and that even worse absurdities were added in order to prove or to disprove the natural origin of the golden tooth. Among those pleading for its originality and, thus, supporting Horst was Martin Ruland, a physician in Regensburg; among the others who, with more common sense, recognized the golden tooth as being an artificial product were the Scotchman, Duncan Liddel, professor in Helmstedt, and Johannes Ingolstetter of Nuremberg, who wrote as many as three books on the subject. Zacharias Liebhold, city clerk of Silberberg, was inspired to a long poem in the form of a dialogue between "a pious surveyor

of mines and a skilful metal tester, he, too, being a miner." A few other poems were written in honor of Jacob Horst, "the prince of Muses' land and famous strategist,—for the physician's art seems, too, a war to me."

The history of the golden tooth found the end it deserved. A nobleman, who was quite drunk, asked to see the tooth. When the boy, fearing some mischief, refused to open his mouth, the nobleman stabbed his dagger into his face and wounded him so that a surgeon had to be called. At this occasion it was found that the golden plate was worn down and the crowned tooth appeared. Thus the fake was detected and the boy was sent to prison.

IV. *The Golden Tooth of the Polish Boy.* Eighty years later, in 1673, a three-year-old Polish boy by the name of Paul, in Vilna, was found to possess a golden tooth. His mother discovered it when attempting to remove some food particles from between his teeth. It was the first deciduous molar on the left side of the lower jaw. The Jesuit pater, Adalbert Tylkowski, in a booklet printed in 1764 in the cloister of Oliva, believed, like Horst, in the genuineness of the tooth and declared it as a proof of the Lord's wrath for the sinfulness of mankind. The bishop of Vilna, however, ordered a thorough investigation of the tooth and its true nature came to light. According to another version, this tooth was surrounded by a layer of yellow tartar which, by the superstitious people, was believed to be gold and which was removed by order of the bishop.

The modern German poet, Ewald Gerhard Seeliger, has made the golden tooth the subject of the following parody:

THE GOLDEN TOOTH

'Round seven years was Christoph old,
When gold grew in his mouth,
A golden tooth! And we are told,
Quite baffling was the growth.
Three barbers and one medico
Examined it an hour or so
And said, "O what a wonder!"

Now show your molar, wonder-boy,
Let's see its size and form.
And soon the fame of the alloy
Spread like a sweeping storm.
The peasants stood as dull as plump
And, fingering the golden stump,
They scratched their scalps and nodded.

But cunning were the city men.
The jeweler was called
Who, using Lydian touchstone then,
Found in the gold no fault.
The dukes and princes came to look
And even Emperor Rudolph's cook
And great Silesian bishops.

A marvel! was the clergy's call,
A marvel! cried physicians,
A marvel! marvel! shouted all
Examiner—commissions.
But he who owned the tooth thought,
"Beeves"!
Laughed secretly in both his sleeves
And praised the clever goldsmith.

In Helmstedt, Jacob Horst the Sage
Had also heard about
The greatest wonder of the age
And he was full of doubt.
And instantly, to give it vent,
To village Weigelsdorf he went
And left as a believer.

He wrote from then on day and night
And filled three hundred pages,
So that the wondrous story might
Be read in future ages.
The tooth of the Silesian lad
Meant beating for the Turks, he said,
And was sent down from heaven.

The Kaiser was in trouble just
When he received the book.
But now he drank two kegs of must
And had a joyous look.
And lucky Horst who found the truth
About the meaning of the tooth,
Was overwhelmed with honors.

But O, there came Hans Ingelstett
And called poor Jack a liar.
Poor Jack was caught in his own net,
His pamphlets found no buyer.
Because the golden tooth, said Hans,
Had put him in a magic trance
And was sent by the Devil.

And in the highest politics
There was a dangerous struggling.
Six ministers were crowned with bricks
And Horst accused of juggling.
He lost his titles all at once
And in the course of seven months
Hans Ingelstett, he got them.

Yet all the people still believed
In Jacob's words for sure,
Until a teacher's brain conceived
A method for their cure.
He laid our Christoph on his knee
And as he spanked him hard, O gee!
The tooth burst all to pieces.

CHAPTER III

GENERAL CONCEPTIONS ABOUT DENTITION

The physiologic occurrence of cutting the first, or temporary, or deciduous, or milk, teeth in children, an absolutely normal, natural and ordinary every-day affair in the household of Nature, has for centuries been made responsible for many diseases and dangers existing between the ages of six months and two years. Not only the laity held fast to the view that the process of dentition is a treacherous one, full of perils and threats, but also among physicians and dentists the assumption of "difficult dentition" has given rise to great confusion and many mistakes in diagnosis and treatment. There is a long list of diseases which were ascribed solely to the eruption of teeth because of their mere coincidence with dentition, serious maladies of the brain, kidneys, lungs, stomach and intestines were overlooked and believed to be symptoms or complications of teething. It was the great merit of Kassowitz to combat this error successfully with his book, entitled "Die Krankheiten im Alter der Zahnung" (The Diseases at the Age of Teething), and published 1892 in Leipzig and Vienna. No medical man or dentist of to-day will overestimate the part played by dentition in the etiology of infantile maladies.

The laity, of course, has not yet overcome the deep-rooted prejudice against the process of teething as being disadvantageous to the child. There is no cold, no cough, no diarrhea, no convulsion in infants at the teething age, which is not instantly derived by the mothers from the cutting of teeth. The term, "to cut the teeth," as such is rather a misrepresentation of the natural fact, as far as

it is suggestive of something violent, painful, uncomfortable, and sudden. As a matter of fact, the teeth come through very gradually and give the organism time to adapt itself to the new conditions. According to Holt, first authority in pediatrics, about one-half of the healthy children cut their teeth without any visible symptoms, local or general; in the remainder some disturbance is usually seen, which is slight and of short duration.

Nothing expresses the popular fear of dentition as well as the Spanish proverb: "When the child cuts its teeth, death is on the watch." The Maronites of Mount Lebanon say: "If my mother only knew when my first teeth will come through, she would prepare a shroud for me." Therefore nothing should be omitted that, in the people's opinion, might help the child to live through that perilous period safely. No expenses should be shunned; there exists a German adage that says: "When a child cuts its teeth, the mother should sell her skirt and buy wine for the baby."

The anxious mother looks out for increased salivation as the first symptom of impending dentition. The children also "scratch their itching gums," thus indicating the approaching appearance of a tooth. In the land around Eger, Czechoslovakia, if the saliva flows too abundantly and the child is not kept clean enough, a condition arises which is considered as very serious and is called "Gurfel"; in such a case they take the child to a flayer, who passes his knife three times through the child's mouth.

Scarification of the gums used to be practiced both by physicians and laymen in almost every case of "difficult dentition." We cannot, however, deal with it as a folkloristic method, since it was generally regarded as a "scientific," medical remedy.

Manifold are the prophylactic remedies, amulets, magics and charms employed in the popular treatment of the process of teething.

CHAPTER IV

PROPHYLAXIS AND THERAPY OF DENTITION

Long before an individual has come into the world there is already much concern about the future condition of his dental apparatus. The prophylaxis of dentition, as seen from the folkloristic point of view, begins indeed at a very early time. In Hesse the prospective parents, on their very wedding day, have among other things the teeth of their not yet existing children in mind. Three crumbs of the bread, which the bride and future mother eats on that day after taking possession of her new home, are put away and kept as part of the family treasure. If, after years, the child begins cutting its teeth, the mother rubs its gums silently with these crumbs. This procedure is supposed to keep from the child the perils of dentition. In some places, particularly in Mittenwalde, Brandenburg, if the child eats some of the bread which was left from the wedding meal of a chaste betrothed couple, it will get its teeth without complications.

Many things must be considered during the period of *pregnancy* if the child is to be protected against uneasy dentition and toothache. The relation between gestation and the teeth is dealt with quite abundantly in popular superstition. Widespread is the belief that pregnancy endangers the teeth of the prospective mother. A long period of empirical observations made throughout the ages led to the folkloristic adage: "For every child a tooth." A proverb coined in Sauerland says: "The young teeth tease the old ones," which means that toothache in pregnancy is thought of as a result of the intrauterine development of the infant.

Whereas in our day modern dentistry has come to the

conclusion that dental affections of the mother-to-be should be given very careful and immediate attention, it has not been very long since even in the medical and dental profession the belief prevailed that the mouth of a pregnant woman is an inviolate Noli-me-tangere for operative procedures and that dental care should be deferred until after childbirth. Extraction of teeth during pregnancy was dreaded as fatal for the successful conclusion of the parturition and harmful to the mother. This is exactly the popular opinion as found almost everywhere in the civilized world as well as in the uncivilized. According to Serbian superstition, a pregnant woman should not have an aching tooth removed or the child will die on the very same day. In Brunswick the result of extraction would not be abortion, as in Serbia, but the child will remain toothless.

Toothache in pregnancy, according to a superstition met with among the peoples of the White Race, indicates that the woman will give birth to a boy.

In some places the mother-to-be is told to be very careful in the selection of her *food,* which might be of some influence upon the condition of the infant's teeth and gums. Pregnant women of the Fiji Islands are not allowed to eat the fish vesu; if they do so, the child will have teeth looking exactly like the teeth of that fish. The women in Mexico, in olden times, had to abstain from certain foods during pregnancy; if they did take tzictli or chicle, a nourishing beverage, the child was expected to have a hard palate and thick gums, which would be a great handicap in the nursing of the baby.

Dental prophylaxis is not forgotten by the Prussians on the *day the child is born.* Some of the relatives, usually the father, has a pail of water beside him, puts one finger in the baby's mouth and wets it in the pail, with these words: "Pain to the ground. In the name of the Father, the Son and the Holy Ghost." This should be done three times in succession, then the baby will have an easy denti-

tion and be free from toothache. In Franconia somebody who knows the charm takes, as soon as the baby sees the light, a small worm out of the bulbs of the hip plant and rubs with it the gums of the new-born until the worm is dead; the child will never suffer from toothache. The Serbians bring on one of the first days a bottle of wine, a loaf of bread and a shirt or new linen to the new-born; the mother must divide this bread with her teeth, then the baby's teeth will become strong enough and it will begin to eat bread at an early date.

The Franconians bring the ceremony of *baptism* in connection with the child's dentition; the midwife rubs secretly its gums with some of the christening water, which will help to endure the difficulties resulting from the cutting of teeth. The parish monthly nurse of Churcham, Gloucestershire, England, used, according to Black, invariably after public baptism, to wash out the mouth of the infant with some of the remaining sanctified water; it was a safeguard against toothache. Such water was so much valued for charms in Cornwall that formerly all the fonts had to be kept locked that the people might not steal it.

In Serbia the godfather should fast on the day of baptism until the ceremony is over, then the child's teeth will be healthy and protected against worms. In Esthonia neither of the godparents should eat meat on that day, or the child will be doomed to suffer from toothache. In Thuringia the godfather protects the infant against the same fate by stamping with his foot three times on the threshold of the church door.

The rules to be observed during the period of *lactation* are these: The Bohemian mother, to save her babe from toothache, has to kneel on her right knee at her first churching. In Stendal, Brandenburg, if the mother leaves the house before her first churching—this should not be done unless it cannot be avoided—she has to run to the next church and to knock at its door. After coming home

from the churching, she must go silently to the cradle or cot, spread over it a piece of the clothing which she wore at church, and breathe three times into the baby's mouth, who then will soon have teeth. The nursing mother in Saxony who wants her baby to cut its teeth at an early date should go home from church without speaking on three successive Sundays and each time blow into the infant's mouth.

It is customary in the European countries to give an *egg* to the child the first time it is taken out to visit the friends and neighbors of the family. Upon this act depends the normal course of cutting the teeth. The relation between teeth and eggs can be seen in the legendary interpretation of that small empty space which exists in hard-boiled eggs, between the shell and the white. In southern Bavaria the people say that this space was produced by the Holy Virgin, who bit off a piece of the egg right there, and upon close examination one can often discover distinctly the impression of her teeth. In Franconia the baby is given a few eggs at the occasion of its first being taken outdoors. In the environs of Speier the child receives an egg wherever it makes its first visit. In other parts of Germany the first egg of a chicken is turned around in the suckling's mouth as it pays its first visit to the family's neighbors and friends in the mother's arm; this egg, then, is made the ingredient of a soup which the child must eat if its teeth are to come out without serious complications. The Thuringians, instead of turning the egg in the baby's mouth, tap with the point of the egg three times on its lips. The donation of an egg to a baby who is not yet one year old during a first visit is reported also from Füssen and Tannheim in the land of Allgäu, and from Swabia, where the egg must be hard-boiled. In those countries which now form the Kingdom of Jugoslavia this custom is very common too. In Swabia the donation of an egg is very often deferred until the time of dentition.

The time and mode of *weaning* are, of course, not exempt

from folkloristic relations to the cutting of teeth. In Bohemia a child will never have toothache if the last time of nursing be on St. John's Day; in Silesia either St. John's Day is selected for the act of weaning, or Maunday Thursday, or a full moon night. The child's teeth, then, will be healthy and never ache. It is also of great importance for the fate of the teeth *where* the last nursing takes place. In the German part of Switzerland it should be done under a walnut tree to secure protection against future toothache. In Bohemia the mother, while offering the breasts for the last time, has to sit on a stone, which should be returned to the place from where it was taken; this has the result that the child will never have toothache. The Silesian mother must sit on the stone with her bare buttocks when the church bells ring; the child's teeth will be as hard as stone. In Franconia she should sit either on a milestone or on the place of the stone after it had been removed. In Wetterau, finally, she must, during the last nursing, push the baby so that it falls over a piece of white bread, and the teeth will come out very easily.

Exceedingly numerous are the prophylactic measures which must be observed when real dentition begins. One very common method consists in *rubbing the baby's gums.* The Mohammedans in Arabia considered it a religious rite which they began on the first morning after the child was born. It was so solemn a ceremony that in Medina the Prophet himself was invited to perform the act. The gums were rubbed with chewed dates, this being the chief nourishment in the later life of the infant. In ancient Greece either butter and honey were used for this purpose or the brain of a hare; in Rome hare's brain or sheep's brain or goat's milk. Hare's brain for rubbing the gums is still employed in modern Greece and in the other countries surrounding the Ægean Sea; in some of those regions the brain is also eaten by the child. (In Germany sheep's brain used to be eaten with honey to facilitate dentition.) In

Swabia the gums are smeared with wine in which a hare's brain was cooked. The Franconians catch or shoot a squirrel and rub with its still warm brain the baby's gums. The Maronites of the Lebanon in Palestine prefer the brain of a sparrow. In Switzerland blood is used which is obtained by cutting a cock's comb; the same is the case in Silesia and in Bohemia. The Russians pierce the comb of a black cock repeatedly with a dense hair comb and rub the gums several times with the blood thus obtained. The inhabitants of Franconia and those of the Erzgebirge, a mountain range between Bohemia and Saxony, take the child to a butcher, who dips his finger in fresh calf's blood and touches with this the infant's gums. The negroes of South Carolina "draw milk from the dawg, rub on flannil, rub on gum"; or they "take droppin' from de rabbit, draw tea out of it, wash de gum in it—rabbit is quick, dawg too, bof quick."

Animals' teeth are another medium of rubbing. The Romans touched the gums with a dolphin's tooth or that of a cur. The Bohemians use the tooth of a wolf or a wild boar, others take pike's teeth and snail-shell in equal parts, burn these on a hot tile and rub the gums with the fine powder; this is followed by a meal of groats or gruel with lemon juice or tartar. In order to help a child to cut its teeth, the aborigines of Victoria fastened to its wrist the front tooth of a kangaroo, which the child used "as a coral" to rub its gums with.

The German inhabitants of Switzerland cut off the paws of a toad or of a water rat and rub with these the child's gums, both outside and inside; then they hang the paws around its neck.

Honey was used by the ancient Greeks to rub the gums in the case of painful dentition. A mixture of powdered alum and honey is still considered helpful in cases of oral infection accompanying dentition. In Styria the father rubs the baby's gums in the morning with his saliva, the mother with her own mother's milk. In Bavaria the father

wets, in the morning before breakfast, his right thumb with saliva (he must not speak as he does so), and rubs with it the upper and lower gums of the infant in the name of the Holy Trinity. The Magyars around Debreczin use the ground root of rhubarb, the Russians lemon juice, the Franconians christening water. Among the Ruthenians the father rubs the gums with the little finger of his right hand, whereas the mother should not touch the child's mouth. The Jews living in eastern Europe have the same custom with the only difference that instead of the father it must be some first-born individual who carries out the act. There is also a custom that the teething child is carried by the mother to the door upon the first entrance of a man who had never seen it before; here the mother offers the newcomer a coin with which he rubs the baby's gums three times; then he takes the coin and spends it for a drink. The Bohemians dispose of a great variety of things with which the gums may be touched or rubbed in order to make dentition easy; they use lard, corals, steel, several kinds of stone, and emerald. Jühling tells of the use of horse lard and of chicken dripping in Germany.

Amulets worn about the neck are found everywhere as powerful prophylactic and therapeutic agents supposed to lead the infant safely through the time of dentition. There is hardly a thing that has not been used for this purpose. Teeth of animals seem to be the most common amulets. The ancient Romans, according to Pliny, to facilitate dentition, suspended teeth of horses and wild boars from their children's necks; the first tooth which a colt has lost was preferred to others, and it was best *"si terram non tangat."* In Argentine the teeth of dogs and fitchews are in fashion, in Franconia the tooth of a one-year-old colt is tied about the neck at the time of the crescent moon, the Bavarians use teeth of chamois mounted in the form of a rosary or those of a mole wrapped in a scarlet red bag. In the environs of Zürich, Switzerland, the parents bite out

the teeth, especially the incisors, of a hare and use them as necklaces for their children at the time of dentition; the same custom is prevalent in Brandenburg. The Maronites of Mount Lebanon add to the amulets which the child wears at the period of teething one more, namely, a mole's tooth. In Franconia and in the Allgäu they hang about the neck of the children, long before the beginning of dentition, either a wolf's tooth or the tooth of a wild boar which is usually mounted in silver. In Styria the teeth of horses and hares are used; in Italy and Turkey the fangs of a swine; in Berlin the teeth of a fox; in Ireland wolf's teeth set in gold and silver; in Portugal, among other things, wolf's teeth; in Ceylon shark's teeth; in Montferrat, Italy, the children wear a wild boar's fang; in Siberia beaver's teeth. In the Philippine Islands they hang crocodile's teeth about the children's neck as a preventive against the perils of teething. The negroes of South Carolina "take the dawg teet' and put 'em in a little bag an' hang 'em roun' de baby neck, an' ev'y teet' will jes' pop out one after de oder." Also teeth of mice, rats, snakes, dolphins, pikes, and tunny fish are worn to drive away the dangers which may arise from the cutting of teeth. The custom of wearing teeth as necklaces against uneasy dentition has also been reported from the Kafirs.

The feelers of a snail are considered by many as the animal's teeth which are believed to be a good talisman against the complications of dentition in Lower Austria, in Swabia and in Bohemia. Here, particularly in the land around Eger, "snail's teeth" are wrapped in leather and suspended from the children's necks. The snail is tortured in many ways, Grüner reports, and the soft antennæ are pitilessly torn out. In Füssen, Allgäu, they are put in small bags and tied about the neck. In the Canton of Zürich the "teeth" of three garden snails are used in the same manner.

The torturing of snails is a very mild procedure compared with another, very cruel, and hardly believable cus-

tom which demonstrates better than anything else the strange, bewildering rules of folklore. The Franconians have the horrible custom of biting off with their own teeth the head of a living mouse, which they wrap in a linen bag and suspend from the child's neck in order to protect it against uneasy dentition. But beware not to make a knot in the thread with which the bag is wrapped about. And if you want to be sure and have good results, you better have the parents or some of the closest relatives do the biting. In Styria it must be the mother who bites off the head. In Swabia the amulet loses its efficiency if the one who does the biting is spoken to during the ceremony. In Speier, if one does not want to submit to this not very appetizing procedure, one may cut off the head with some object of gold. The custom is spread all over Bavaria and Brandenburg. In Silesia the head must be bitten off by a male individual and suspended by means of a red thread. In Mecklenburg a thread is passed through the eye of a mouse and tied around the neck while it is still soaked with blood; in other places it is passed through both eyes or through the ears.

After learning this, the reader will not be surprised if he hears that in Upper and in Lower Austria even the entrails of a mouse may be used as an amulet at the time of cutting the teeth.

In Upper Austria, in Bavaria, Thuringia, and Franconia the forelegs of a mole, preferably the right foreleg, do the service if bitten off with the teeth and suspended from the neck, either wrapped in a sack or mounted in silver. The following is a prescription as carried out in Thuringia: The father of the child catches a mole and squeezes it to death with his fingers, then he either knocks off one of its paws with an ax or bites it off with his teeth, and sews it into a small sack which he ties about the baby's neck. In Bavaria and Switzerland the paw of a living toad or of a water rat may be used in the same way.

The Tungus women in Siberia, to facilitate dentition, suspend a reindeer bone from the baby's neck.

Lammert is authority for the strange Bavarian custom of protecting the child from the perils of dentition by suspending from its neck a small sack containing a few hairs which a hare had lost during the act of copulation.

The American negroes, particularly those living in Baltimore, tie a sawyer bug around the baby's neck and trust that as soon as the bug will die the teeth will cut without difficulty. They also suspend from the neck a piece of the hide of a hare's abdomen.

The Bavarians are advised to catch an adder at a certain time when it is supposed to be soulless and to let it die in a pot by means of hunger and heat. Then it is placed in an ant hill until it is eaten up entirely by the ants and nothing left but the bones, or it is boiled (in Tölz in the kitchen of a brewer) to preserve the bones better than would be the case in the ant hill. These bones are perforated and strung on a thread and suspended from the child's neck.

Necklaces of corals or pearls as safeguards against the complications of teething are used in Bavaria, Styria, Bohemia, and in other European countries. The ancient Romans at Pliny's time recommended to wear coral necklaces against all kinds of diseases.

Of the plants used for amulets to facilitate dentition, the seeds of the peony and the roots of iris are the most popular. Peony seeds are employed all over Germany and Austria. In Franconia any odd number, usually seven or nine seeds, are tied about the baby's neck. They are also well known in the Slavish and in the Scandinavian countries. They are commonly called "tooth pearls," and Marie Andree-Eysen writes: "One would not understand why just these fruits should serve as safeguards against toothache and to make dentition of the children less dangerous, if one would not think of the resemblance of the pericarp in which they

are encompassed to the shape of a tooth with roots. They are known in the drug stores as Semen pæoniæ and are demanded by the populace as tooth pearls." The name of the plant is derived from the Greek god and physician, Paion or Pæon, who first discovered its medical properties and cured Pluto with it.

The root of iris is popular, too, as amulet for teething children all over central Europe. It has been in use for this purpose since the time of the ancient Romans, and serves also for the manufacture of the so-called "ambra-pearls" which are believed to be infallible teething charms.

Seeds of Anacardium, called "elephant's lice" by the Germans, are tied about the children's necks in Franconia. They are strung on a thread in any odd number, boys wearing male (large) seeds and girls female (small) seeds.

Other plants used as teething amulets are: horseradish in Styria, shepherd's purse, vervein and barberry. In Bavaria the seeds of the dried shells of shepherd's purse are wrapped in a pink rag and tied about the child's neck; after completed dentition the rag is taken off by the mother and thrown silently backward into running water. The Bavarians also use the yellow flowers of barberry, which are sewed with red silk first in a linen rag, then in a red silk bag. All the sewing implements—needle, silk threads, and the flowers—must be kept together in a special box. The little bag is suspended from the teething baby's neck and replaced by a new one every month on the same day of the month and at the same hour of the day, without speaking. The amulet should never be taken off, not even if the child is given a bath, and must hang on the back. The old bags are burned instantly, with nobody speaking, and then three pater nosters are prayed. If, incidentally, the parents forgot to take off the old bag on the due day, it must be left on for another month, when it is exchanged for a new one. In Wurttemberg teething necklaces with the fresh herb of vervein are in fashion; they are put on

the eleventh day of each month at eleven o'clock in the forenoon. These amulets are directed toward the pit of the stomach and, after being left on for a month, thrown into an open fire. The seeds of the common mullen, too, are suspended in a linen rag on the chest if the front teeth are coming through, on the back if the hind teeth are cutting.

Amulets consisting of glass beads are common amongst the Franconians, Styrians, and in Oldenburg; in Bavaria a malachite stone is worn not only by the child itself, but also by its mother and nurse; the green stone may be fastened to a finger ring or to a chain. The Djolof negroes of French Sudan put around their teething children's necks copper rings from which five or six copper bands with glass beads on their free ends hang down. A silver chain does the protecting service in Thuringia, an amber chain in the Baltic Provinces, in southern Germany, and in Galicia. The Russians fill a nutshell or quill with quicksilver, cover the opening with wax, then sew it into a linen or silken rag or into a piece of glove leather and fasten it to a ribbon which the teething child wears around the neck.

The wearing of a sucking bag helps the children in Oldenburg, in other places a rattle makes the teeth cut easily.

The Swahili prepare at the time of their children's dentition the so-called "charm of binding" which prevents the teeth from growing in the wrong direction and also takes care of the succession of the eruption. This "dava za fungo" is made by the older men or women of the village; they gather roots of all kinds of herbs and wind them into amulets to be tied about the children's necks.

Next to rubbing the gums and wearing of amulets, *biting* or *chewing* of more or less hard things is the commonest safeguard against uneasy dentition. There is practically no place on earth where the parents do not take refuge in this method of pacifying their teething children. Although the objects upon which the babies are to chew

are too numerous to be mentioned in an exhaustive list, there are a few items which seem to be chosen for the given purpose almost everywhere. Thus the root of iris is used not only as an amulet, but also to have the children chew upon. Wax candles are in fashion, too, and so are pieces of liquorice, fennel, elder blossoms, and catmint. The Slovaks boil elder blossoms, and wrap them in rags which are bitten by the children "to soften the gums." The Russian babies chew the leaves of catmint (Nepeta cataria) which stimulate salivation. The Magyars in the environs of Debreczin let their children chew on a new key.

In the European countries, in Asia, and in America it is very customary to have the babies chew on a ring. Sylvia Townsend Warner, in her novel, "Lolly Willowes or the Loving Huntsman," refers to this custom in the following passage:

"Will you miss me, Tito?" said Laura, and stooped down to lay her face against his prickly bib and his smooth, warm head. Tito fastened his hands round her finger.

"I'm sure he'll miss your ring, Lolly," said Sibyl. "You'll have to cut the rest of your teeth on the poor old coral when Auntie Lolly goes, won't you, my angel?"

"I'll give him the ring if you think he'll really miss it, Sibyl."

Attempts are also made to relieve the pain and itching accompanying the cutting of teeth by the ingestion of certain *foods*. The Roman babies had to take a not very appetizing nourishment if they were to be spared from the bad complications of dentition. They were supposed to eat house mice which were believed to be a good remedy against abundant salivation. The mice were to be eaten alive! In Switzerland the children are given a pap of linden sprouts which were cut on Good Friday at twelve o'clock. In Bohemia the mother bakes (the children should not know it) cracknels on the night of the first Lent Sunday, fixes them on the points of rods and hangs them up on

trees in the garden. For each child one rod is designated. In the morning the children are sent to the garden, with these words: "Go to the garden, the fox has lost some cracknels there!" The children then find the cracknels and eat them. They will never be bothered with toothache.

A very strange prescription is reported from Saxony. You must catch an entirely black cat, and exactly at midnight take twelve drops of blood from the tail and give the blood to the teething child. Still worse is the rule existing among the Slovaks, who treat complications of dentition by pressing the baby's right thumb and at the same time urinating into his mouth!

The Micronesian Naura withhold warm food from their infants when the teeth are to come out. In medieval Germany meat of chicken and partridge taken from the breast was considered very good for teething children.

Almost everywhere we find the opinion that the bad complications of dentition could be kept away by keeping the bowels open. Flügel reports this belief from Franconia. For this reason the Slovaks hate to check diarrhea occurring in children at their teething age; if they do so, the babies will have difficulty in cutting their teeth. In Dalmatia the little ones are given castor-oil and enemata to facilitate dentition.

Arriving at this passage, after having learned of the many strange methods of guarding the infant against uneasy teething, the reader will hardly be surprised if he is told that even the baby's *bed* or *cot* or *cradle* is surrounded with all kinds of things which are supposed to have a magic relation to the future of the teeth. It is difficult to reason out just why the mere presence under the pillow of a trousers-button or the dried navel string, preserved since the birth of the baby, should be so very helpful and keep the child out of danger and sickness, as the Franconians and Thuringians believe. Now ask the Bavarians, for instance; they will tell you that the best

thing to do in such a case is to nail the two jawbones of a hare to the right and to the left side of the baby's cot, respectively, and everything will turn out right. You also may keep a hare's head with strong teeth under the pillow. If you live near Potsdam, that beautiful summer resort of the Prussian kings, you are advised to place a bone, found incidentally, under your youngster's palliasse. Yet the greatest variety of customs pertaining to this category is met with undoubtedly among the Silesians. Just listen to all the things you may do there to protect your child against the perils of dentition: Keep the wedding ring of either parent or the mother's bridal wreath in its bed; or take a whole window wing out of its place and put it over the cradle; or touch your baby's mouth with the mother's bridal wreath; or keep a few gallnuts under the pillow.

There exists a certain folkloristic relation between dentition and the act of looking into a mirror. Andree relates that the Polish Jews let their teething children see their images in a looking-glass; if they do so, their teeth will never ache in later years. According to my own information, however, just the opposite belief prevails there; a child who has no teeth should not look into a mirror or its teeth will not be strong. There is also a German superstition that if a child less than one year old look into a mirror, its dentition will be difficult. The same fate awaits the baby seeing its image in the mirror in Felnémet, Hungary. In the Hungarian Comitats of Nógrád and Bács, if a child happens to look into a mirror, the teeth will stop growing.

There are many more superstitions centered upon the eruption of the deciduous teeth. In fact, I do not believe that any compilation of manners and customs concerning dentition could ever be made complete. To make full use of the material at my disposal, I may be permitted to mention a few more of the popular methods believed to lead the child safely through that perilous period of life.

In Thuringia it helps if a dog is allowed to lick the baby, or if the baby wears a hat.

In Brunswick it is good to set the child on the back of a perspiring horse; in Chemnitz, Saxony, it must be a black colt.

In Franconia you just have to carry the infant along with the procession on Corpus Christi Day.

In Brandenburg its mouth is beaten against a table, or against a ram when the cattle come home from the pasture in the evening.

In Silesia the first bread which is to be used for the sucking bag must be held over an ax, or the sucker is moistened with christening water; then the child will cut its teeth very easily. It also helps if you take the baby's shirt off by pulling it over the head and then burn the shirt, or if you place your baby on the crossing of two planks.

In Serbia a key is turned around several times in the child's mouth and then hidden in a place where it never could be found again; the teeth to come will be as strong as iron. If a baby cries too much during the period of dentition, the Serbian mother should slap its cheek and say: "My baby cries not on account of his teeth, but on account of the blow."

In Turkey uneasy dentition is treated by the midwife, who burns with a red-hot needle several times the place under the tongue.

The Galelareese think that you ought not to comb a child before it has teethed, for if you do its teeth will afterwards be separated from each other like the teeth of the comb.

In Saxony the child will have bad teeth if the mother, while in childbed, happened to stick needles into the curtains.

CHAPTER V

THE APPEARANCE OF THE FIRST TOOTH

DENTITION, according to the general belief, being one of the most important and also most dangerous processes in the life of an individual, it is easily understood that very great attention is paid by the baby's relatives to the eruption of the first deciduous tooth. Almost everywhere the mother or the father inspects the child's mouth very carefully each day to see if the eagerly expected little white spot has found its way through the gums.

Particularly among the Germanic nations is this event considered as a regular family affair. From a short poem written by the German poet, Matthias Claudius, the "Messenger of Wandsbeck" (1740-1815), we learn that occasionally the first tooth to appear is even given a special name of its own. The verses are not very ingenious nor even artistic; they aim to be popular, to express the folk-soul, to reproduce the joy over the successful cutting of the first tooth, and the wishes combined therewith:

MOTETTO,

By Matthias Claudius.

Victory! Oh, victory!
The little snow-white tooth has come.
Oh, mother, dear, you children all
And everyone that's in the hall:
This little tooth what shall we call?

Oh, name it Alexander, mother,
We pray the Lord, my boy, to give it constant health
And other little teeth like this, and heaps of wealth,
That hunger never be a bother.

Among the Germans and also in the Scandinavian countries it is very common to distribute gifts at the occasion of the eruption of the first milk tooth. Originally the baby itself was supposed to be the receiver of the donation. Already in Nordic myth, we find the mention of the "tooth-gift." We hear that Frey, the god of rain and sunshine, has been given Alfheim, his fairy palace, as a teething gift (tannfé). In an Old Norwegian amulet-oracle of the tenth century, it is reported that Haakon Siguretarson Hlada-jarl of Hladin in Norway was killed while asleep by his Knight Kerkur whom he had received as a teething present.

Nowadays either the child itself receives the gift, as in the olden times, or some poor woman, or (in Hesse and in the central parts of Germany) the one who has first seen the tooth and reported it. "The one who finds the first tooth gets a new dress," is a phrase in the Province of Brunswick, though the dress is not always given. A teething gift of very questionable value is recorded by Grimm from the Land ob der Ens. If the one who beholds the first tooth of a child hands him a rough blow the eruption of the following teeth will be very easy.

To the Semites, as well, the teething gift is familiar. The Maronites of the Lebanon arrange a festival during which the mother is congratulated with the words: "His tooth has appeared, his mother will be glad!" Sweets and a kind of pudding cooked in water are distributed among the relatives and friends. Omission of this custom would have the inevitable effect of making the teeth grow in the wrong direction. The Chaldeans of the Urmia Plateau in Persia dispense, when the first tooth comes through, cereals and certain meat foods (khachichi); they believe that this act is a powerful prophylactic against headache. The fellah women in Palestine greet the first tooth with the cry of joy: "His tooth has come through, hide the bread in the house!"

The Dravida tribes of southern India and Ceylon know

and practice the custom of gift-giving at the time of teething. Among the Nair in Malabar the mother at the sight of the first tooth sends cake to the friends of the family.

Among the negroes in Jamaica the present is given to the child himself, "so that his teeth may never rot."

An event of outstanding importance is the eruption of the first tooth among the Battaks in Sumatra. As on the day when the child was born, so also then the day is "read" to the baby. They call this "ngage," and it is thought of as a kind of prophecy and oracle predicting the future of the child.

In ancient India the appearance of the first two teeth was believed to be of the greatest importance to the child and also to the other members of the family. There exists an old hymn referring to this superstition (quoted from Avesta, 6, 140):

"These which growing large, like tigers wish to eat father and mother, these two teeth, Brhaspati, make them propitious, o Jatavedas.

"Eat rice, eat barley, and eat sesame: this is the food which is meant for you; do not injure father and mother.

"Invoked are the two united teeth, that they be kind and auspicious; may your dreadfulness turn elsewhere, teeth: do not injure father and mother."

CHAPTER VI

THE FATE OF THE CAST MILK TEETH

It is one of the great mysteries of folklore that the same ideas and the same customs occur in various races who do not come in contact with each other, do not know of each other, and differ from each other entirely in color, surroundings and civilization. We may find a custom practiced among some of the Malayan nations which may be unknown to their closest neighbors of the same race, yet very common among some negro tribes of Central Africa. But there are conceptions and customs which are found invariably all over the inhabited earth, not excepting even the remotest spots of the globe. An outstanding paradigm of this is the fate of the cast deciduous teeth. Disregarding a few minor modifications incident with the single customs, we may state that at any time as far as history of mankind can be traced back, at any epoch of civilization, and at any place where men live, very definite rules were, and are, observed regarding the disposal of the children's shed milk teeth. The eruption of the permanent set, its whiteness, strength and health all depend upon the precise execution of these traditional prescriptions. They have nowhere been considered important enough to be made a part of the religious rites, as are so many of the dental mutilations, you will not find them in any of the ancient codes, the official medicine men of the savages do not care about them, and yet there is not one mother (not excepting at least fifty per cent of those mothers who live in the most civilized regions of this planet) who would allow these rules to be neglected. Here a strong superstition, there merely a thoughtlessly repeated habit, here

degraded to the rank of a nursery rhyme, there a very serious ceremony, they have all in common an ancient, one may say, atavistic tradition which the inhabitants of our most modern countries share with the most primitive men, ranging little higher in their mentality than the eagerly sought for "missing link."

The basic act is this: If a milk tooth falls out, the child is supposed to throw it away over its shoulder backward, or over a roof, or into a mousehole, and ask a mouse, or a rat, or a squirrel, or a fox, or some other animal to take the tooth and to give the child a better one instead.

Among the thousands of invocations reported in literature, heard everywhere, differing very little in their texts, the mouse plays a predominant part. Rochholz believes that the mouse is brought in connection with the children's teeth for this reason, that it is an attribute of Saint Gertrude and that this saint had taken over the functions of a heathen goddess, Holda (Frau Holle), who was worshiped as the mother of all creatures and the patroness of fertility, together with the offices of Berchta, a Germanic fairy and probable origin of the "White Lady." On the other hand, we see that a great number of non-Germanic and non-Aryan peoples, who know nothing of Holda-Berchta, have exactly the same custom, must therefore dismiss this interpretation as too locally limited. Julius von Negelein sees in the custom an offering to the spirits of the ancestors who in the old Indo-Germanic times were pictured as mice. The Armenians still believe that the manes of the deceased members of the family settle in the hearth in the form of mice. The fireplace is sacred to the Armenians, and they sacrifice to the hearth their cut hair and finger nails and their shed teeth. The simplest, although least exhaustive, attempt to explain the tooth-mouse relation is that with the invocation of the mouse the desire is expressed to get permanent teeth as healthy as those of a mouse.

To start with the uncivilized peoples, we may mention that among the natives of the Seranglao and Gorong archipelagoes, between New Guinea and Celebes, when a child loses his first tooth he must throw it on the roof, saying: "Mouse, I give you my tooth; give me yours instead." In Amboyna the custom is the same, and the form of word is: "Take this tooth, thrown on the roof, as the mouse's share, and give me a better one instead."

In ancient Mexico, when a child was getting a new tooth, the father or mother used to put the old one in a mouse's hole, believing that if this precaution were not taken the new tooth would not issue from the gums.

Among the Maronites of Mount Lebanon, if a child loses a deciduous tooth, the parents say jestingly: "The mouse has come and fetches the tooth."

The Russian children go behind the stove, throw the cast tooth backward over the shoulders, and say: "Mouse, little mouse, yours is the carrot-tooth, give me a tooth of bone." In Ukrainia and in eastern Galicia the tooth is thrown backward over the head on the roof, with these words: "Mouse, mouse, here you have a tooth of bone, give me one of iron." This makes that the new tooth will be stronger than the one that had fallen out. Among the South Slovanians, too, the child is taught to throw his tooth in a dark corner and say: "Mouse, mouse, there is a bone tooth; give me an iron tooth instead." Jewish children in South Russia throw their cast teeth on the roof with the same request to the mouse to give them an iron tooth for a tooth of bone. Similar customs and invocations exist in Lithuania, Latvia and Esthonia, which before the World War formed a part of the Russian Empire. The Jewish children in Bukowina, formerly an Austrian province, now possessed by Roumania, throw the tooth on the floor and ask the mouse for a steel tooth in place of the one of bone.

In Germany it is an almost universal maxim among the people that when a child loses a tooth it should be inserted in a mouse's hole. This will prevent the child from having toothache. In Brandenburg superstitious people tell their children to go behind the stove, throw the tooth over the head, and say: "Mouse, give me your iron tooth, I shall give you my bone tooth." Or one says: "Tooth, tooth, come on, that I may catch you fast; out, out, you are food for the mouse." In Silesia, western Bohemia and in Altenburg the children trade in "a bone for a stone"; in Westphalia "a bone tooth for an iron tooth"; in Thuringia for a steel one; in Brunswick, in Baden, and in the Tyrol an old tooth for a new one; in Hesse and in Prussia a wooden tooth for one of bone. In the Rhine region they sing: "Mouse, mouse, come out and bring me a new tooth." In Wurttemberg and in Swabia they say: "Mouse, mouse, there is a tooth for you; give me for it another one." In Switzerland and in Pomerania the mouse is requested to replace the cast tooth by a golden one, which should be "nice and white, that I can bite the bread." In Oldenburg, after throwing the tooth "to the mouse," the children should never see the tooth again. In Hiddensee, Island of Rügen, they have this verse: "Mouse, mouse, mouse, cousin, I give you a bone tooth, give me a steel-iron one, which does not break, which does not ache, which will not pain during all my life." In all these cases it is hoped that the new tooth will come through at an early date and that it will be as strong and white as that of a mouse and never ache.

In Norway the mouse is requested to give a gold tooth for the one of bone.

In place of the mouse another rodent is frequently invoked, the rat. At Raratonga in the Pacific, when a child's tooth was extracted, the following prayer used to be recited:

"Big rat! little rat!
Here is my old tooth.
Pray give me a new one."

Then the tooth was thrown on the thatch of the house, because rats make their nests in the decayed thatch. The reason assigned for invoking the rats on these occasions was that rat's teeth were the strongest known to the natives. In the Kei Islands, to the southwest of New Guinea, when a child begins to get his second teeth he is lifted up to the top of the roof in order that he may there deposit as an offering to the rats the tooth which has fallen out. At the same time some one cries aloud: "O rats, here you have his tooth; give him a golden one instead." Among the Ilocans of Luzon, in the Philippines, when children's teeth are loose they are pulled out with a string and put in a place where rats will be likely to find and drag them away.

The Maori mother of New Zealand sings, if the infant's teeth begin to come out, this song:

"Sprouting seed, sprout,
Sprout, that you may come
To see the moon now full,
Come, you sprouting seed,
Let the teeth of the man
Be given to the rat
And the rat's teeth
To the man!"

The negroes of the Carolinas, United States, teach their children to throw their cast teeth over the house with the request to the rat to take their old tooth and give them one white as milk instead.

It is not always a mouse or a rat that is expected to bring the child a new and stronger tooth. Any strong-toothed animal that is popular enough will serve the purpose. Thus when his tooth drops out a Singhalese child will throw it on the roof, saying: "Squirrel, dear squirrel, take this tooth and give me a dainty tooth." In Bohemia, too, a squirrel is invoked; the child goes behind the stove, throws the tooth over his head, and utters three times these words: "Squirrel, squirrel, I give thee a bone, give me an iron tooth."

Among the Cherokee Indians, when the loosened milk tooth of a child has been pulled out or has dropped out of itself, the child runs round the house with it, repeating four times: "Beaver, put a new tooth into my jaw," after which he throws the tooth on the roof of the house.

In Bohemia a child will sometimes throw its cast tooth behind the stove or in the open air backward over the head, asking the fox to give him an iron tooth instead of the bone one. If this be neglected, the new tooth would be loose and fall out soon.

In Lower Styria the procedure is exactly the same, but here a cat is invoked to bring the new tooth.

A dog is supposed to do this service for the Chaldean children; if the tooth be offered to a dog, the new tooth will be very solid. The Armenians bury their teeth at the edge of the hearth with the prayer: "Grandfather, take a dog's tooth and give me a golden tooth." Among the Thompson Indians, when a child lost its teeth, the father used to take each one as it fell out and to hide it in a piece of raw venison which he gave to a dog to eat. The animal swallowed the venison and the tooth with it. "Doubtless," says Frazer, "the custom was intended to ensure that the child's new teeth should be as strong as those of a dog." In Wurttemberg a wolf is invoked in place of a dog.

In Macedonia a child carefully keeps for a time its first drawn tooth, and then throws it on the roof with the following invocation to the crow:

> "O dear crow, here is a tooth of bone,
> Take it and give me a tooth of iron instead,
> That I may be able to chew beans
> And to crunch dry biscuits."

In Styria the fire takes the place of an animal. The cast tooth is thrown into a fire with these words repeated three times: "Fire, I give thee a bone tooth, give me an iron one." Among the Wends, shed deciduous teeth should be burnt, then the new teeth will never ache. In Tyne-

mouth, Northumberland, if a child loses a tooth, this is covered with salt and thrown into a fire with these words spoken by the child: "Fire, burn; burn the tooth and give me another one. Not a black one but a white one; not a curved one but a straight one." Or: "Fire, fire, burn, burn, God will send me another tooth." In Yorkshire when a child's tooth comes out it must be dropped in the fire and the following rhyme repeated (otherwise the child will have to hunt for the tooth after death):

"Fire, Fire, take a beean,
An' send our Johnny a good teeath ageean."

Among the heathen Arabs, when a boy's tooth fell out, he used to take it between his finger and thumb and throw it toward the sun, saying: "Give me a better one for it." After this his teeth were sure to grow straight, and close, and strong. Among the Maronites of the Lebanon, when a child loses a milk tooth, he throws it toward the sun, with these words: "Sun, sun, take the ass's tooth and give me a deer's tooth." The Kongo negroes throw the first tooth which a child loses toward sunrise, saying: "If you come back, bring me a new tooth." Then they throw a piece of coal westward, and say: "Take my old tooth, I don't care for it any more." According to Frazer, the reason for throwing the old teeth toward the sun would seem to have been a notion that the sun sends hail, from which it naturally follows that he can send you a tooth as smooth and white and hard as a hailstone.

The cast upper milk teeth are thrown into a rainbarrel by the Japanese, the lower on the roof of the closet, whereupon these words are uttered: "As my teeth are feeble, I trade them for those of the devil."

In South Carolina, when a "chil' sheddin' teet', take an' put 'em in a corn-cob, an' fling it right over de house." This practise was referred to as "callin' de new teet' back."

In Silesia and in Styria mothers sometimes swallow their

children's cast teeth in order to save their offspring from toothache. Among the Wendish populace of the Spreewald, if a child loses its first tooth, the mother is supposed to swallow the tooth of her son, the father that of the daughter. Among the Warramunga of Central Australia, when a girl's tooth has been knocked out as a solemn ceremony, it is pounded up and fragments placed in a piece of flesh which has to be eaten by the girl's mother. When the same rite has been performed on a man, his pounded tooth must be eaten in a piece of meat by his mother-in-law.

There is a superstition prevailing in the Anglo-Saxon countries that if a cast milk tooth be thrown away and by mischance found and gnawed by an animal, the child's new tooth would be, for all the world, like the teeth of the animal that had bitten the old one. In Pennsylvania, if a hog happens to swallow the cast tooth, the new one will have the shape of a hog's tooth, if a dog eats it, the child, to be sure, will have a dog's tooth. The same belief exists in Canada. Frazer relates that in Sussex, some forty years ago, a maid-servant remonstrated strongly against the throwing away of children's cast teeth for the reason given above. In proof of this she named old Master Simmons, who had a very large pig's tooth in his upper jaw, a personal defect that he always averred was caused by his mother, who threw away one of his cast teeth by accident into the hog's trough.

The connection between tooth and tree which, we shall see later, occupies a large territory in dental folklore, is not forgotten in the case of handling the cast milk teeth. In the Palatinate the careful father who wishes to save the child from toothache for the rest of its life takes the first tooth his offspring loses out to the forest quite early in the morning, so that nobody might see him and observe his actions. He inserts the tooth in the hole of a willow tree, closes the hole carefully with a wooden plug, prays a pater-

noster and Ave Maria, and then returns assured that the child's teeth will never ache. The Transylvanian gipsies plug the first cast tooth into a small tree hole to make sure that the child will have healthy teeth. In Swabia the permanent teeth will come through at an early date if the first tooth which has fallen out be buried under an oak tree.

Teeth which fall out during the seventh year of age should be preserved; in later years they have the power of relieving toothache.

PART II

POPULAR DENTAL HYGIENE

CHAPTER VII

GENERAL APPRECIATION OF HEALTHY TEETH

"A DIAMOND is not as precious as a tooth," says Cervantes in his wonderful novel, "Don Quixote." This statement of the great Spanish writer, whose works represent in every line the folk-soul of his country people, occurs in similar form in the literature of almost all existing languages. White, healthy teeth are valued very highly, and if we look over the proverbs, popular quotations, folk-songs, poems and other oral expressions coined by the many peoples of this earth, we find that where there is a slightest trace of civilization there is also some form of dental hygiene. It is true, of course, that systematic sanitation of the oral cavity is an acquisition of our modern time, but it is just as true that even in the oldest periods of history a perfect row of snow-white teeth was considered one of the most important postulates of beauty.

An Egyptian stela in the Louvre, singing the praise of a beautiful Pharaonic princess who died about 700 B.C., calls attention to the fact that her teeth were harder than the flints on the sickle.

The ancient Hebrews had much to say about the teeth and their beauties. "Thy teeth," sings Solomon, "are like a flock of sheep that are even shorn, which came up from the washing; whereof everyone bears twins, and none is barren among them." Jacob, blessing his children, promises Judah teeth whiter than milk, and his teeth became, indeed, so strong that, according to Rabbi Chanina, when he was in wrath he could crush with them iron plates to powder. A priest who had a defective set of teeth was not admitted to services, as his hideous appearance made him disquali-

fied. (Similarly, a German proverb says that he who lost his teeth cannot be a good regent.) A husband was granted a divorce on the ground of his wife's toothlessness.

A tooth was so valuable to the Hebrews that if the master "smite out his man-servant's tooth, or his maid-servant's tooth, he shall let him go free for his tooth's sake." Even if the tooth had been loose before but still could be used, its loss should be repaid with the restoration of liberty, also, if by the blow the tooth did not fall out but became loose and useless. But if the master happened to knock out the milk tooth of a young slave he did not have to let its possessor go free. If the slave's master happened to be a physician who, performing a dental operation on the slave, carelessly pulled out one of his teeth, the slave should be given his freedom as a compensation for the loss of the tooth.

There are quite a few things which were considered detrimental to the teeth by the ancient Hebrews. Continuous fasting made them black. Vinegar was bad for healthy teeth, but was supposed to be a good remedy in the case of toothache caused by ulceration of the gums. Says Solomon: "As vinegar to the teeth, and as smoke to the eyes, so is the sluggard to them that send him." The steam of the bathing-house had a bad effect on the teeth. Sour grapes rendered them blunt, hence the adage mentioned both by Ezekiel and Jeremiah: "The fathers have eaten sour grapes, and the children's teeth are set on edge." (In Bukowina, one still hears occasionally people say: "The grandfather ate sour grapes, and the grandchild became sick with toothache.") Leek was not good for the teeth. Spleen was very good if chewed upon, but after chewing it should be spit out again as it was not good for digestion.

Says Rabbi Jochanan: "Better is he who whitens his fellow-man's teeth than he who gives him milk to drink."

Rabbi Meir may be looked upon as the first teacher of "Fletcherism." He is authority for this phrase: "Bite with

the teeth, you will find it in the feet," which means, translated from Talmudic language into common speech: Well chewed is well digested. In the same sense a very similar German proverb says: "Grind it with the teeth, you will find it in your feet."

The Talmud advocates that tartar should be removed from the teeth.

Sudden fright is apt to make a person's teeth fall out. As an example, the Talmud relates the story of some people who lost their teeth when a lion, at a distance of five hundred parasangs, started to roar.

In ancient Greece, according to the philosopher Theophrastus (382-287 B.C.), it was considered a virtue to shave frequently and to have white teeth. Regular dental hygiene was not known in Greece until the country was made a Roman province. Under the influence of their western neighbor, the Grecians learned how to keep their teeth clean. They used pumice, "Arabian stone" (talcum), emery, granulated alabaster stone and coral powder for dentifrices. Iron rust, too, was recommended. Hippocrates devised a tooth powder consisting of burnt hare's head and three mice. Following Aristotle, it is dangerous to keep a diamond in the mouth, for diamond breaks everything, and the teeth would inevitably crack. Burnt purple shell was believed to have the power of polishing the teeth. Trumpet-shells mixed with salt and burnt in a pot, were supposed to give a good powder for cleaning the teeth. Diocles of Karystos writes: "Every morning you should rub your gums and teeth with your bare fingers and with finely pulverized pennyroyal, inside and outside, and remove thus the adherent food particles."

The Romans disliked discolored teeth *(dentes picei buxeique)* and used several methods of preserving their white color. White teeth, according to Cicero, were the first requirement of beauty: *"Bona dicantur necesse est: candiduli dentes, venusti oculi, color suavis."* Ovid says

to a woman: "From the whiteness of your teeth I conclude what attention you pay to the Graces." Catull, describing the charms of Panthea, speaks of her white and well-shaped teeth which he compares with a necklace of beautifully shining pearls.

Numerous are the recipes of dentifrices met with in Roman literature. The interested reader will find them in Martial (14, 56), Catull, Pliny, Galenus, Aetius, Cælius Aurelianus (2, 37), Tertullian, Ovid (Ars amandi 3, 216), and Apuleius (Apologia). From these places it may be readily seen that tooth powder was very skilfully prepared and generally used by the Romans. All kinds of substances were employed in their preparation: the bones, hoofs and horns of certain animals, crabs, egg-shells, and the shells of the oyster and the murex. They are first burnt and sometimes mixed with honey and then reduced to a fine powder. Although fancy and superstition very frequently directed the selection of the ingredients, the addition of astringents, such as myrrh, or of niter and hartshorn ground in a raw state, indicates empirical science, the intention being to clean the teeth and to render them white, to fix them when loose, and to strengthen the gums. Scribonius Largus is authority for the statement that the tooth powder used by Messalina, the wife of the Roman emperor Claudius, was composed of calcined stags' horn, mastic of Chios and sal ammoniac.

According to Catull (Carmina 37 and 39), Apuleius and Diodorus, the teeth were cleaned in the morning with the urine voided during the night!

The Hindu lover, enumerating the charms of his sweetheart, never forgot to mention the whiteness and regularity of her teeth as an especial attraction. The Singhalese expect of a beautiful woman that her teeth be small, regular, and closely set, and like jessamine buds.

The maiden whose loveliness inspires the most impassioned expressions in Arabic poetry has, beside other attrac-

tions, teeth like pearls set in corals. The Arab writer, Al Kasem Hariri (1054-1122), of Bassora, is enchanted by the teeth of a girl, which "shone like pearls, hail, or drops of wine, glimmering in white splendor like camomiles or palm blossoms."

In China the presence of a perfect set of teeth is appreciated as absolutely necessary for a man or a woman who claims to be beautiful. Joking a person whose teeth are defective, one says there: "The dog's holes are opened wide." If an old man is asked how he gets along and how he puts up with his advanced age, it is considered very polite to put it in these words: "Your honorable teeth?" In Mitford's "Tales of Old Japan," a "peerlessly beautiful girl of sixteen" is described as having small and even teeth.

The Turkish wooer, visiting the girl of his choice, attempts to get her to laugh by making all kinds of jokes in her presence; his object in doing so is to study the condition of her teeth as she laughs. The young fellahs in Palestine wish to have a sweetheart who has pretty, white teeth.

The beautiful woman as she appealed to the German authors of the twelfth and thirteenth centuries must have small white and even teeth. Adam de la Halle, the Artois trouvère of the same period, in a piece *("Li Jus Adan ou de la feuillie")* in which he brings himself forward, praised the white teeth of his mistress, which were arranged in regular array. In the twelfth century story of Aucassin et Nicolette, the latter was described as having small and white teeth. The teeth of a lady, who was praised by Alain of Lille, "seemed cut in ivory." In the Irish "Tain Bo Cuailgne" we read of the Badhbh or Banshee who appeared to Meidhbh, that her teeth were so new and bright that they seemed like pearls artistically set in her gums. Whiter than showers of pearls were the dental organs of an ancient Irish hero, as described in "The Banquet of Dun na n-degh." "Close and well set were her ivory teeth," says an old Irish song of

a "fair woman." The feminine ideal of the Italian poets must have small teeth, polished as ivory, and symmetrically arranged; Petrarch, enumerating his Laura's beauties in the "Canzoniere," does not forget to call attention to the whiteness of her teeth.

Robert Herrick, English poet and clergyman (1591-1674), says this in praise of beautiful teeth:

"Some ask'd how pearls did grow, and where,
Then spoke I to my girle,
To part her lips, and showed them there
The quarelets of pearls."
(The Rock of Rubies, and the Quarrie of Pearls).

The following is a verse of a poem set to music by Richard Alison in the sixteenth century:

"Those cherries fairly do enclose
Of orient pearl a double row,
Which, when her lovely laughter shows,
They look like rosebuds fill'd with snow."

How much teeth were valued in medieval France, is demonstrated by the remark made by Guillaume de Tudela: *"Cant perdra Tolosa, perdra la millior dent"*—(If he loses Toulouse, he will lose his best tooth), comparing this very important French fortified port with a tooth.

Bad teeth or toothlessness are the object of scorn and contempt. In Saxony an old maiden with defective teeth is jestingly spoken of as "the one with the wooden molars." In the Voigtland, Germany, they have this little popular song:

"There, yonder, on a hill,
There is a little house,
There are three little girlies
Behind the window frame.

The first has a hunchback,
The second is lame,
The third has, by golly,
Not a tooth in her mouth."

The savages, too, think very highly of beautiful teeth. They even are not satisfied with that which nature gave them as a gift, they file and dye their teeth and change their shape and appearance. Of this we shall speak later. But here it is the place to state that many primitive peoples have something that may be dealt with under the heading of popular dental hygiene. In a folk-song overheard in North Celebes, there is a passage extolling the "beautifully spotted" teeth of a girl. The natives of the Island of Nauru pay very great attention to the care of their teeth, the condition of which is decisive in the valuation of beauty; they feel badly insulted if it is said of them that their teeth are defective or unclean. Rinsing the mouth with water after each meal is customary among the Loango negroes and the Wanyamwesi tribes. The Swahili use charcoal powder as a dentifrice or rub their teeth with the pulverized rind of the betelnut-palm.

Very many further examples could be cited of how well some savage peoples take care of their dental organs, but we also must mention the fact that there are enough exceptions to this rule. Of the aborigines of the New Hebrides it is said that their teeth are dirty and never submitted to cleansing. The Masai of East Africa have carious teeth which are discolored, and the gums are dark red and spongy. Almost proverbial is the very bad condition of the dental apparatus of the South American Indians. They usually lose their teeth when they are quite young. The reason for this is chiefly their mode of nutrition. Their food consists principally of flour, the grain being ground very insufficiently and admixed with the stone dust of the grinding-mill. The imperfectly triturated flour causes abrasion of the teeth, which, eventually, is followed by carious destruction of the organs. The same is said to have been the case among the ancient Egyptians; the East African negroes, according to Weule, have a similar mode of nutrition, and therefore their teeth are in poor hygienic condition, too.

Another cause for the bad hygiene of the teeth in a number of uncivilized peoples is the decoration of their lips, which are pierced for the insertion of more or less long sticks or disks of various sizes. These, consisting of wood, horn, metal, bones, or other substances, prevent the wearer from closing his or her mouth, thus perpetually exposing the teeth to the influence of the atmospheric air, which is very warm in day time and quite cold at night. Thus, dust and dirt are deposited on the teeth which, if not cleaned frequently, inevitably become a prey of carious destruction.

Of the uncivilized or half-civilized peoples of Eastern Europe, the Voguls, a tribe of Finno-Ugrians in the northern regions of the Ural mountains, chew the resin of larch trees in order to keep their teeth firm and clean. The Cossack women of southern Russia pay much attention to their gums and teeth when they take their traditional Saturday-afternoon bath.

In civilized Europe many prescriptions existed in the Middle Ages and still exist to-day, which are intended to guarantee a set of healthy teeth. In Styria you should eat dark bread if you wish to have white teeth, in Swabia, moldy bread, in Silesia, Westphalia and among the Wends, in the Bukowina, in Croatia and elsewhere it must be bread which was gnawed upon by a mouse. If you pay a visit somewhere and are treated to bread, you should either eat it all or, at least, put in your pocket that which you did not eat; if, instead of doing so, you leave it on the table, your teeth will be very bad and bother you considerably. For the same reason you should not eat anything while the church bell rings during a burial. In Franconia this prescription is more specialized and elaborated than elsewhere: There you should stop eating if during a burial "the sign is given," that is the ringing of the smallest bell after the large bell has rung twice, and before the chiming of all bells together; if you keep on eating your teeth will become bad

and fall out ultimately. If you take part in a funeral and happen to have a piece of bread in your pocket, you should not eat it, or your teeth will become hollow and fall out. The same effect will be reached if you eat during a thunderstorm. To have white and healthy teeth, you should eat bread which has been carried over the roots of a tree. You should not drink cold water if you just ate a warm dish. Sour apples are detrimental to the teeth. The Slovaks get "numb teeth" *(ztrnute zuby)* if they eat unripe, sour fruits. The eating of turnips makes the teeth fall out.

He who is first to see the new moon will have a set of healthy teeth. The Ukrainians, to make sure that their dental organs will be in ideal hygienic condition, stop at the first sight of the new moon, pray three paternosters, spit three times backward over the left shoulder, and go away without looking back; this should be done every month. Or they stand still facing the moon, take some earth from underneath the right heel and rub the teeth with it, using it as a kind of magic dentifrice.

In northern Germany a seamstress who works on a shroud should not bite off the thread with her teeth, lest they might decay and fall out.

Elder wood should not be burnt in the house in Roumania and among the Slovaks; if they do so, their teeth will be very bad.

The Chaldeans of Persia believe that if a small stone happens to fall on a tooth and you crush it at once, this tooth will be healthy and never bother you.

For tooth powders, the following substances are commonly in use: charcoal obtained from the lime-tree, calamus (the unpeeled dried rhizome of Acorus calamus, or sweet-flag), cuttlefish bone (os sepiæ), tobacco ashes, hartshorn, chalk, pulverized eggshells, toasted bread, ground quartz pebbles, alum, and similar substances. They are rubbed on the teeth with the bare finger, or with a corner of the handkerchief, or with a small linen rag, less frequently with

a regular toothbrush. The Bohemians should not rub their teeth more than about once or twice a week.

It is not uncommon among the peasants of eastern and central Europe to clean their teeth in the morning with their own urine. But usually they rinse their mouth with water, or vinegar, or brandy. Vinegar, in which the branch of a pine tree has been boiled, is given preference by the Czechoslovakians. Decoctions of all kinds of plants are employed for mouthwashes by the various peoples, the use of blackberry leaves, rose leaves, pellitory roots, alder catkins, rosemary, sage, marjoram and houseleek being met with most frequently.

CHAPTER VIII

MASTIC, BETEL, GAMBIR

Another mode of securing clean and healthy teeth is the chewing of certain substances. If we neglect the habitual mastication of tobacco and gum where the idea of dental sanitation comes in secondarily, if at all, this method is practised, but very exceptionally among the nations of western civilization. The Slavs of Central Europe chew rosemary leaves to keep their teeth white, and the Bavarian herdsmen use either pitch or olibanum sylvaticum, a resin obtained from the spruce which, when chewed, adheres to the teeth and partially dissolves in the saliva, which it renders milky.

In the Oriental countries the masticatory method of dental hygiene has from time immemorial been employed by both men and women, chiefly by the latter, to preserve the gums and the teeth. The classical substance used for this purpose in Greece, Turkey and the other Balkan countries, in Minor Asia, Arabia, Persia, India and Egypt, is *mastic,* a concrete resinous exudation from Pistacia Lentiscus. It also goes under the name of mastich, mastiche, or mastix; Italian, mastice; Spanish, almastiga; Turkish, sakes; Arabian, arah; Persian, misteki rumi; Indian, rumi mastekie. The lentisk is a shrub or small tree, twelve feet or less in height, much branched toward the top and furnished with peticolate, abruptly pinnate leaves. It is a native of the regions bordering upon the Mediterranean. The fruit yields by expression a fixed oil of a deep green color which the Arabs of North Africa use both as an article of diet and for light.

Mastic is, according to the "United States Dispensatory," obtained chiefly from the Island of Chios, in the Grecian Archipelago, where the tree is cultivated for this product. It grows only in the northern part of the island, all attempts made to cultivate it in the southern portion of Chios did not succeed. Incisions are made in the month of July in the trunk and principle branches from which the juice slowly exudes and either hardens in tears upon the bark or drops on the ground where it is received upon cloth or the bare earth and concretes in irregular masses. The tears are most esteemed; they are of various sizes, oval or roundish, often compressed, smooth, semi-transparent, of a pale-yellow color, of a shining fracture, friable, and usually covered with a whitish powder occasioned by their friction against each other. They are brittle but become plastic when chewed. The masses consist of yellowish agglutinated tears, with others of a darker color and less translucent, and often fragments of wood, bark, or earthy matter intermingled. The juice may also be obtained by spontaneous exudation from the branches, where it concretes in drops which, after hardening, are gathered under the name of tears. But the greater part of the resin comes from longitudinal incisions in the stem, made with a knife close together, and extending from the root to the branches. In fifteen or twenty days the resin has concreted and is collected in the month of August in little panniers of white paper or cotton cloth. Great care is taken to prevent it from falling on the ground and becoming soiled by the earth, and if any is thus soiled it is immediately cleansed at the time of collection.

Each tree yields an average of ten pounds of resin annually, and the shipments from Chios were estimated in the year of 1875 at thirty thousand kilos per year. It must be mentioned that mastic is not collected in all places where the tree flourishes.

Mastic is nearly inodorous, unless rubbed or heated, when

it becomes fragrant. Its taste is weak but agreeably terebinthinate and, after long chewing, very slightly acrid. It is at first friable under the teeth but soon becomes soft and plastic and acquires a white opaque appearance.

Practically all Levantine women chew mastic, which keeps their teeth white and healthy and replaces completely the use of toothbrushes, dentrifices and mouthwashes. In Algeria, Pistacia Atlantica yields a solid resin which is collected and used by the Arabs as a masticatory. The Chaldeans in Persia have the superstition that one should not chew mastic at night, for this would be equal to chewing the bones of the dead.

Dioscorides tells us that the decoction of the leaves of the mastic tree has the power of making loose teeth firm, and that the resin exercises an astringent influence on the gums.

During the fifteenth, sixteenth and seventeenth centuries mastic had a high reputation as a medicine and formed an ingredient in a large number of medical compounds; but its use in medicine is now obsolete, and in the occidental countries it is chiefly employed for making varnish.

Although the custom of chewing mastic is spread over a very large territory, extending from Morocco and Algeria over Egypt, Minor Asia and Persia until India, it cannot be compared in frequency with the mastication of *betel.* It is estimated that not less than one-tenth of the whole human family indulge in betel chewing. Men and women, young and old, rich and poor, delight in it from morning to night. The use of it is so general as to have become a matter of etiquette; the Malays seldom go out without their betel boxes, which they offer to one another on ceremonial visits in the same manner as wine is produced on similar occasions by Europeans, or as snuffboxes used to be passed around in former time. The chewing of betel is a practice of great antiquity and can be traced back with certainty to at least the fifth pre-Christian century. In 1599, Richard

Hakluyt, an English historian and explorer, mentioned its use in his "Voyages" (2, 223), but thinks erroneously that betel was eaten instead of chewed. He writes: "Great quantie of Archa which fruit they eat . . . with the leaf of an Herbe which they call Bettell."

"Betel" consists of several ingredients: the betel leaf, the betel nut, and shell lime. The first is the leaf of a shrubby evergreen plant, Clavica betle or Piper betle; it is plucked green, spread over with moistened quicklime (chunam), generally procured by calcination of shells, and wrapped around a few scrapings of the areca nut, which is also called betel-nut, and known to the natives as pinang. In some cases a little cardamom, turmeric, or other aromatic is added.

The areca palm is a native of the Malay Peninsula and Islands and is extensively cultivated over a large area in the East, including southern India, Ceylon, Siam, the Malay Archipelago and the Philippine Islands. It is a graceful tree with a straight, slender, unbranched stem reaching forty or fifty feet in height and about one foot in circumference. The fruit is about the size and shape of a small egg and of an orange-yellow color, and contains the nut embedded in a fibrous, fleshy envelope. The kernel is of a roundish-conical shape, rather larger than a chestnut, externally of a deep brown, diversified with a fawn color, so as to present a prettily mottled appearance, internally brownish and with whitish veins, very hard, of a feeble odor when broken, and of an astringent, somewhat acrid taste. It abounds in tannin, contains also gallic acid, a fixed oil, gum, a little volatile oil, lignin and various saline substances. The fruits are annually gathered between the months of August and November before they are quite ripe, and deprived of their husks. They are prepared by boiling in water, cutting up into slices, and drying in the sun, by which treatment the slices assume a dark brown or black

color. On the Indian markets the fruit is sold under the name of "sooparee."

In place of, or together with, the areca nut, the Malays also use gambier, or *gambir,* an extract of Uncaria gambir, a climbing shrub of the natural order Rubicaceæ. This is a native of Malacca, Sumatra, Cochin-China, and other parts of Eastern Asia and is largely cultivated in the Islands of Bintang, Singapore, and Prince of Wales. The gambir, according to the United States Dispensatory, is prepared by lopping off an iron pot filled with boiling water. "When the leaves are exhausted and the liquid sufficiently thick, it is poured into small wooden tubs, and so soon as sufficiently cool, a half-closed hand is plunged into the semi-fluid and a piece of light wood, shaped like an elongated dice-box, rapidly worked up and down in the hollow formed by the hand. The extract begins to thicken by a process which is compared to crystallization. The mass is finally turned out and cut into cubes which are put upon trays and smoke-dried."

The natives of the regions in which betel is chewed have a special industry which consists in the preparation of betel or "sirih" boxes. They are made of bamboo, silver filigree and other substances and are often very artistic. The Anthropological Museum in Dresden has a large collection of sirih-boxes made in Timor, an island in the Malay Archipelago, which are richly ornamented and show chiefly representations of lizards or crocodiles.

The chewing of betel and gambir is not primarily intended for hygienic purposes. The users of mastic always have the condition of their teeth and gums in mind, it has absolutely the significance of a dental prophylactic. But there is no statement of any kind which would mention betel as a means of preservation of the teeth. In fact, the reports that are found scattered in journals and books are very contradictory, some affirming that betel keeps the dental

apparatus in very good shape, others assuring that the custom destroys the teeth in a very short time. The truth is that the chewing of betel contributes a great deal to the rarity of caries among those indulging in it. Schröder, who studied these conditions, found that dental caries is so scarce among the Malays that it must surprise every dentist who comes in touch with them. Yet there exist quite a few predisposing factors. The Malays have unusually large teeth standing very close by each other and having very frequently deep fissures and depressions of the enamel, which naturally would favor the process of bacterial destruction. Besides, the food of the Malays consists chiefly of vegetables, such as rice, wheat, oat, and leguminous substances, which are likely to have a similar effect on the teeth. Nevertheless, one will look in vain for caries of the front teeth in their oral cavities, and what little there is of dental disease, is limited to the bicuspids and molars. Schröder explains this fact so that the chewing of betel is an excellent prophylactic against dental caries. The Malays, after eating their rice and sweets, reach instantly for their betel, which through its contents of tannin and gallic acid has an astringent and antiseptic effect. The quicklime which is added to the masticatory solves the constituents of the mixture and causes thus their rapid distribution. The hard ingredients procure, aided by increased salivation, a thorough mechanic cleaning of the teeth, while the lime neutralizes any traces of acid whch might have formed. All this must prevent the development of caries.

The permanent mastication of betel and gambir dyes the teeth either red or black, but this effect is only transient and can be easily removed as long as the enamel is not altered. Dentine, which is not protected by an uninjured layer of enamel, does not lose the stain again and even the strongest acid cannot remove it.

CHAPTER IX

THE FOLKLORE AND CULTURAL HISTORY OF THE TOOTHPICK AND TOOTHBRUSH

It is not known exactly just how old the toothpick is, but it seems as though this little instrument was already in fashion in prehistoric times. Great reserve and criticism are indicated as to the very difficult interpretation of the many toilet articles found in a number of archeologic excavations. Several utensils were brought to light which, it was declared by experts, might possibly have served to remove adherent food particles from between the teeth. They usually formed a part of a set composed of two, three or more pieces which were held together by means of a metal ring, in much the same way as a bunch of keys is carried in our day. Such sets, made of bronze, of iron and in a later period of silver, were found in ancient graves in northern Italy, in Switzerland and in France; they usually consisted of a small earpick intended for the removal of ear-wax, a tiny fork with two prongs used either as a head-scratcher or as a nail-cleaner, and a thin lancet pointed on one end which might have been employed as a toothpick.

If we accept this assumption, and the author is inclined to do so, then we may concede to the method of practising mouth hygiene by means of a toothpick an age of at least three thousand years.

In Hallstatt, a village in Upper Austria, near Salzburg, an ancient necropolis was discovered containing about a thousand tombs of armed warriors dating back more than ten centuries before Christ, when the Gauls, or Galatians, established an oriental civilization in the Danube valley among the tribes living in Carinthia, Switzerland, Silesia, Bohemia and Bosnia.

Among the many and various articles of the Hallstattian era which furnish many evidences of the passage from the use of bronze to that of iron, there are two rings, each of which presents four toilet articles of bronze; one is preserved in the British Museum in London, the other piece is contained in the Figdor collection in Vienna. Both have a thin instrument pointed on one end which, with great probability, although not with certainty, may be assigned as a toothpick. In another set made of silver, which is said to have been found in Norcia and is in the possession of Professor Belluci in Perugia; it is much more difficult to determine whether one of its six constituents might or might not have served the purpose of cleaning the teeth. Two comparatively primitive toilet implements were unearthed in the central part of France, and it is remarkable that here the supposed toothpick is rounded on its blunt end to form a small, spoon-shaped earpick, a combination which is still met with in so many toilet sets of the present time. We have no convincing proof, however, that all these utensils or even some of them were indeed employed as toothpicks.

We have not much more positive knowledge of the real nature of toilet sets discovered in tombs dating from the period of classical civilization. Neither the very elegant piece found in the Crimea, nor that the Salisbury, England, nor the many articles reported from Italy and France can be absolutely identified as toothpicks. That they have existed, we learn from the occasional remarks of Greek and Roman writers.

The first author who made mention of a toothpick in *Greece* probably was Alciphron, an epistolographer and sophist living in the second century before Christ. In one of his epistles, Eubulos writes to his friend Gemellos: "After the meal the one cleaned with a toothpick the fibrous residues which had remained between the teeth from the food; the other one lay down thoughtlessly and would rather sleep

than care about the table." The Greek term used here for the instrument is karphos (or karpos), which means blade of straw.

This name at the same time points to the material of which the toothpick consisted; so do two other words found in the Greek literature: kalamis, that is, reed, and pteron, or quill. The latter term is used by the Sicilian writer, Diodorus (first century before Christ), who tells of the King Agathokles of Syracuse, who was in the habit of cleaning his teeth with a quill after each meal. Mainon, who sought the tyrant's life, made use of his habit in that one day he offered him a quill which was soaked with poison. The king, who had not the least suspicion, picked his gums for quite a while with it. Soon he was bothered by continuous complaints which culminated in unbearable pain until he was released by death.

A particular Greek name for the toothpick not derived from the material of which it was made does not appear in literature until the sixteenth century, when the physician Gorraeus in his work on medical definitions translated the Latin word dentiscalpium by the corresponding term odontoglyphon.

The name dentiscalpium was known already to the *Roman* satirist, Marcus Valerius Martialis, who lived at the time of Nero, from 40 to 103 A.D. He mentions the toothpick not less than four times in his works. In one place he speaks of seven toothpicks as Saturnalian presents.

In the fourteenth book of his epigrams he tells us that if the small sticks of leaf-wood are not at hand, a feather may be used for the cleaning of teeth:

> Lentiscus melius: sed si tibi frondea cuspis
> Defuerit, dentes pinna levare potest.

In the sixth book finally, he makes fun of a certain man who lies if he digs in his mouth with a toothpick, for he has no teeth:

Foditque torsis ora laxa lentiscus,
Mentitur, Aefulane: non habet dentes.

The term lentiscus, which appears for the first time in these quotations from Martial, originally designated the mastic tree, Pistacia lentiscus Linné, the Greek name of which is schinos. From its branches the toothpicks were snipped off. Sachs, in his monograph on the toothpick and its history, cites a phrase used by an ancient writer which is derived from the word schinos: *schinizein tus odontas,* meaning the toilet of the teeth by means of a toothpick of mastic wood. Those Greeks who had the habit of having such a stick in their mouth all the time were given the nickname of schinotroges, or toothpick corroders.

At the time of the great Roman emperors, the toothpick was a very common toilet article and was present in the boudoirs of the elegant ladies. The contemporary and courtier of Nero, Petronius, who, on account of his good knowledge and judgment of etiquette was given the honorary surname of *arbiter elegantiæ,* describes in all details a banquet or symposium of that time. There he tells that the host was carried into the hall on a sedan when all guests were assembled and, before he addressed them, picked his teeth with a silver toothpick. "As this is the only place," says Sachs, "where mention is made of a toothpick used by the Romans which does not represent a simple product of nature, but is distinguished by its preparation of precious metal, it seems very probable that here we have not to deal with a common fashion but that Petronius makes his Trimalchio, which perhaps is a pseudonym for Nero, do things which are so crazy that no one else would imitate them. And the toothpick at that time appears indeed to have been rather a toilet article, a precursor of the toothbrush, than a nicely manufactured luxurious vademecum."

The *Talmud* on several occasions speaks of qesem, that is, chip or splinter, which was divided on one end by chew-

ing and biting and then used like a toothbrush. Often fragrant wood was used for this purpose. Reed, too, was employed in the cleaning of teeth, but the Talmud warns against its use, for it may break off very easily and injure the gums. Solomon ben Isaac, the great medieval rabbinic scholar and commentator, better known by the name of Rashi, declares the aversion of the Talmud against the use of reed for toothpicks as originating in the assumption that "an evil spirit rests upon it."

The Midrash, in one place, says that "even reeds for chiccun were not missing in Palestine." Chiccun is thought by some interpreters to be identical with the Syrian word chacina, the toothpick, but this explanation has not been generally accepted by all expounders. It seems as though such a splinter was kept in the mouth permanently by some people, and Preuss sees in this a first attempt in orthodontics, in that the toothpick we held between the teeth in order to correct dental malpositions. This opinion seems to be rather far-fetched. As we shall see later, keeping the toothpick in the mouth all day long was a habit in many countries in the Middle Ages and even in later centuries. That is was not considered a bad habit by the ancient Hebrews is evident from the fact that, while they were not permitted to carry anything on Sabbath nor even to wear jewelry, they were allowed to carry the splinter in their mouth.

The toothpick is further mentioned in the following Talmudic simile: "If one says, 'Take out the splinter from between your teeth,' the other answers, 'Take out the rafter from your eyes.' "

The natives of *India,* according to the Kamasutram of Vatsayayana, rubbed their teeth for about one hour with the branch of a fruit-bearing fig tree. Sumner says that the modern Hindus clean their teeth with a fresh twig every day, and are horrified that Europeans do it with a brush made of the hair of an animal, and do it frequently

with the same brush. There are days on which they are not permitted to brush the teeth on pain of hell.

The toothpick plays a very important rôle in the life and religion of the *Mohammedan nations,* particularly the Arabs. We owe to Wiedemann several very exhaustive and instructive papers on the valuation of the toothpick among the Moslems. These papers and biographies of the Prophet were the author's principal sources for the following paragraphs:

According to Wiedemann, the Arabians distinguish between siwak or miswak, and chilal. Siwak is a small staff with which the teeth are rubbed and cleaned; its end is often but not always changed into a brush by chewing and tapping, which makes the fibers separate from each other. It does not correspond to our toothbrush, however, for the fibers lie in a direction parallel to the longitudinal axis of the staff and not perpendicular, as in the case in our modern toothbrushes. Chilal is a toothpick with which adherent food particles are removed from the dental interspaces.

The very popular siwaks are made of several woods, most of which are more or less fragrant. Not less than seventeen plants are enumerated in a list which was compiled from three Arabian works ("Kitab al Bajan," by Gahiz, Ibn Sida's statements in "Dinawari," and the book "Muwashsha," by Al Washsha, who lived about 900 A.D.):

1. Basham, Commiphora opobalsamum Engler.
2. Dirv, Lentiscus.
3. Utum, Olea europea var. oleaster.
4. Arak, Salvadora persica. Of this plant the famous Arabian botanist, Abu Hanifa at Dinawari, says: The roots and branches of arak furnish the best and most sweet-scented toothbrushes.
5. Urgaun, the stem of the peduncle of the date palm.
6. Garid, the leaf rib freed from the parenchyma.
7. Ruchama, Conculvulus lanatus Vahl or reticulatus Chois.
8. Ishil, perhaps Cordia gharaf Ehrenberg.
9. Jastaur, some kind of a tree.
10. Tiwama, a tree having the aroma of myrtle.

11. Tum, perhaps garlic.
12. Darum, a thistle shrub.
13. The roots of the lily.
14. Sugar-cane.
15. Wood of Prunus Mahalab.
16. Roots of Schcenanthus or Andropogon, a grass.
17. Knots of Dracunculus.

On page 140 of the book "Muwashsha," there is a very interesting account of the great importance which the Arabs attach to the use of the siwak. The chapter has the heading:

"On the Siwak and on that which is Said about the Wood of Arak."

Know that among the elegant people who take pride in their appearance and among those who possess a fine education, among the religious and those who come along in haughtiness, there is a habit of using the siwak and of cleaning the teeth with it. It is intended in the first place to clean (the teeth) and particularly to polish them; it corresponds best to fine education and gives it perfection. The elegant and well-educated people use it with predilection. It has properties which pass for beautiful and forms a part of Sunnah (divine law).

Of the prophet it is said that he advises: "You shall clean your mouth, for this is a means of praising God." According to Abu Bekr al Siddiq (The Truthful, caliph from 632-634), he has said: "The siwak is an implement for the cleansing of teeth and a pleasure to God." My father told me (he knew it from Ibn Abi Shaiba, he from Abd Allah b. Idris, he from Muhammed b. Ishaq, he from Abd Allah b. Abi Bekr, he from Omar, he from Aisha, Muhammed's favorite wife) that the Prophet said this: "The siwak is an implement for the cleansing of teeth and a pleasure to God." According to Abu Malih, who had it from Watila b. al Asqa, the Prophet said: "I am ordered (by God) to use the siwak so that I take it as if it had been written down for me (as a special commandment)." According to Ibn

Abi Mulaika, Aisha said: "The Prophet died in my house, on my night and on my day (Muhammed visited his wives in regular turns) and on my lap; I mixed my spittle with his spittle." I (that is Ibn Abi Mulaika) said to her: "O mother of the believers, how did you mix your spittle with his?" She said: "Abd al Rahman b. Abi Bekr came in and had a siwak in his hand; the Prophet looked at him, and I said I would like to have the siwak. I took his siwak, chewed it and offered it to Muhammed, whereupon he cleaned his teeth with it." Even the approach of his death did not keep the Prophet from asking for the siwak, for it certainly is the most elegant thing that is used, and the most suitable that is considered beautiful, for it makes the teeth white, clears the mind, makes the breath fragrant, quenches the bile, dries the phlegm, strengthens the lower portion of the gums and gives vigor to the gums and to the teeth, makes the sight clear, sharpens the eyes, opens the constipations and stimulates the appetite.

The siwak is made of arak, sugar-cane, roots of the lily, wood of mahlab, roots of idchis, and the knots of dracuncula. The use of always new, not yet employed material contributes to the perfection of its elegance. The siwak is used only at certain times and in suitable places; at other times and on other places its use is not customary. One may use the siwak in the morning and evening hours, at noontime, before breakfast, after prayers, if the stomach is empty, at bedtime, and in Lent. In various places the elegant world should not use the siwak: in the closet, in the bathhouse, in the street and in places where people assemble. None of these people use the siwak while standing or leaning against something, or in bed, or if somebody is watching; one does not use the siwak either when speaking. The use in closets or bath-houses only occurs in poorly educated people, not in the respectable and well-reputed.

The elegant world uses for the toothpicks nice little

vessels of ebony and of reticulate bamboo reeds, turned boxes, oiled (varnished, painted) toothpick doses (miswak dana, a partly Arabian, partly Persian word), and the so-called "sanunas" especially manufactured for this purpose.

For the use of the miswak they have certain times which are prescribed just like written divine commandments and official traditions, and they prepare themselves for this time. The end of the miswak is not used very long, they consider this indecent. In order to protect the miswak against dirt and dust and becoming unclean, they employ ribbons of gauze silk and of flock silk.

The better people also give the miswak away as a present. To them, it seems to occupy the place of a pledge, a keepsake, deposited goods, and a kiss, just so as it is the case with chewed incense and a bitten apple."

There are a few other quotations which are supposed to have been said by the Prophet, on the toothpick. "A prayer which was preceded by the use of a toothpick is more worth than seventy-five common prayers." "God has advised me to use the siwak so impressively that I almost feared he might prescribe it to me as a revealed law." "If it were not too great a burden for the believers, I would prescribe that they use the toothpick before each prayer." He is also reported to have said jokingly that the angel Gabriel has commended the toothpick to him so often that he was afraid he might lose his teeth because of their frequent rubbing with it.

Four things, according to a report which is found in the "True Traditions," are to be considered as the chief advice of the Prophet: the siwak, the use of perfume and henna, and marriage.

In the book "Kitab al Bajan," its author, Gahiz (died in 869 A.D.), says that God has enjoined the use of the siwak on the Prophet because it is one of the chief elements of good behavior, and that he has always encouraged him to use it.

The Prophet's comrade, Abd Allah Ibn Masud, was given the surname of Al Miswak as an honorary title.

As the great Arabian philosopher, Gazali, reports in his book "The Beginning of the Leading," the Prophet one day went to a bush and got there two siwaks; one was curved, the other straight. One of his mates was with him. To him he gave the straight one and kept the crooked toothpick for himself. The man said: "O envoy of the Lord, thou hast more right to keep the straight one than I have!"

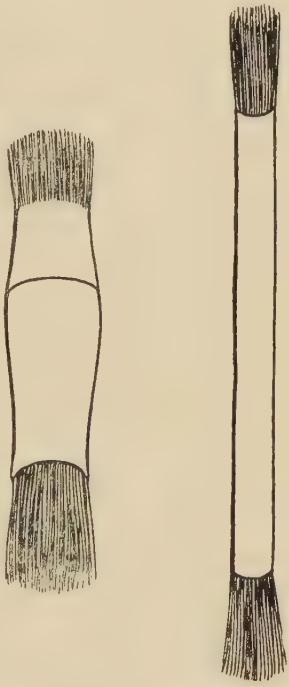
One of the ten effects of the toothpick is that it makes the Devil angry; it is pleasant to God, but hated by Satan.

Toothpicks of aloe wood which were dipped in the water of the sacred well, Zamzan, in Mecca, are regarded as very valuable, and all pilgrims who come to this town take some of these siwaks home with them.

It is natural that the Mohammedans, who are not allowed to eat pork and who regard hogs as unclean animals, have a great horror against our toothbrushes with their hog bristles. A certain explorer, who traveled in Arabia, used the policy of declaring that the hair of his toothbrush was that of wild horses of his home country. Their aversion against hog bristles was so invincible that he had to tell them a fib in order to make them speak to him.

Not only the Moslems attach great religious importance to the use of toothpick or toothbrush; according to Goldziher, the *Persian* (Zoroastrian) Parsees considered the use of the toothpick a ritual procedure. There is a treatise, written in the Pahlavi language and named Shayash-la-shayash, in which the rule is given that a toothpick be cut free from the bark, and it is added that if a toothpick, which was made for the mouth from the bark, drops to the earth and a pregnant woman happens to step on it, she becomes frightened, "for it is dead matter." And touching dead matter makes unclean. Another treatise, Sad-dar-Banda-trish, tries to explain this passage by stating that the fright is caused by the fact that the child might be damaged.

The great Persian poet and mathematician, Omar Khayyam, the author of the famous "Rubaiyat" (1025-1123), used to clean his teeth with a golden toothpick while he studied intensively the metaphysical problems in Avicenna's work "Shifa." When he had reached the chapter "On the One and the Many," he placed the toothpick between two pages and said: "Call the almoner, I wish to make my testament." So he made out his will, stood up, prayed, and ate and drank no more—and died. As he did not take any food before his death, he had no need for the toothpick, since he had left it in the book. This is the only place where a golden toothpick is mentioned to have been used in the Orient.



Arabian Toothbrushes.

Toothpicks were probably well known to the ancient *Chinese*. E. Knuth, according to Sachs, found in Tsinanfu several antique toilet articles of bronze; three of them, pointed on one end and more or less curved, may have been used to remove food particles from between the teeth. In our day, toothpicks similar to the Arabian siwak are not uncommon, especially where modern civilization has not yet made its appearance. The South Kensington Museum in London possesses a Chinese dinner set of ivory and bronze dating from about 1820; it consists of a thin case that may be fastened to the clothes by means of a small strap, in which a knife, two staffs, a nail-file and a toothpick of modern appearance are kept. There is a picture, painted in 1768 by the famous Chinese artist, Kitao

Shigemasa, which shows the interior of a perfume and toothpick store; we see there a great display of toothpicks in paper cases and also toothbrushes made entirely of bamboo, the ends of which are notched and look very much like the described siwak of the Arabs.

In *Japan,* until not so very long ago, small staffs were used for the purpose of tooth hygiene, which were divided into their fibers on one end and employed in much the same way as the siwak. They were called "koyoji." In the last few years one of the smaller effects of Japan's rapid Europeanization was that the sticks have given way to the usual toothpicks and toothbrushes, and to-day Japan is said to supply the United States with millions of cheap and modern toothbrushes.

The *Siamese,* too, have toothpicks. There is a beautiful, very artistic set of toilet articles in the Indian Museum in London containing seven pieces, one of which has served to clean the teeth.

There is a short note in the Dental Brief of 1906, according to which the use of the toothpick made of branches of the arak tree dates back in *Egypt* to the third millennium before Christ. I was not able to detect the original source of this statement. It is beyond doubt, however, that in the last few centuries the toothpick was very common in Egypt and also in Nubia. In the place of the arak tree, in some parts small pieces are broken off from a certain rush species for the very same purpose.

The siwak or miswak, which is usually met with in Africa under the name of msuaki, is fashionable almost all over the continent down to the southern Bantu tribes. There are, or at least there were until a very short while ago, many thousands of caravan carriers who did not have anything about them but a pumpkin shell for drinking water and a msuaki. Velten reports its use among the Swahili, but says that only the women clean their teeth with it. In northern Morocco, according to Zegelin, the stalk of an

umbelliferous species is employed. The Madi tribe make their toothpicks of branches of Cratæva Adansonia, the Kitsh and Bor of Salvadora persica.

"For a great number of years," says Luschan, "I have tried to find out where the original habitat of this implement is, but I have not yet come to any conclusion in some measure satisfactory."

There is a superstition in *Tonga* that, when a man is taboo'd after he had touched a dead body, he must not feed himself with his own hands, but must be fed by somebody else: he must not even use a toothpick himself, but must guide another person's hand holding the toothpick.

In Europe the period of the over-refined, effeminate, fastidious culture of the Roman Empire was followed by a more than one thousand years' epoch characterized by continuous shocks and confusions. The migration of nations, the invasion of barbarous, entirely uncivilized peoples into Europe, the crusades, with their horrible consequences, made the Europeans forget the finer forms of elegant living. Amidst bloodshed and slaughter, there was no room in the frightened, bewildered minds for the thought of etiquette and good manners. The rough time had rough customs. Like so many other achievements of the antique Mediterranean civilizations, the hygienic conceptions of cleanness and physical culture were entirely forgotten. The care of the teeth naturally made no exception.

The primitive methods of freeing the dental interspaces from remaining food particles consisted in poking them with a knife or a fork or even with the finger nails. We are reminded of our modern cartoons where oftentimes the new-rich is caricatured who works his teeth with his fork or knife. We also think of Tyll Ulenspiegel's friend, Lamme Goedzak, the gluttonous, who—in Charles de Coster's most wonderful novel—enjoys a big meal of ham and picks his teeth with his finger nails. Sachs, in his monograph, repro-

duces a part of a Flemish relief of the fifteenth century illustrating a Pharisee who stirs in his mouth with a big table-knife. (To cite a parallel from the Dark Continent, we may mention in this connection that Patrick Greene, in a novelette dealing with Rhodesia, speaks of a native man who "used his finger for a toothbrush.")

When, in the twelfth and thirteenth centuries, the political conditions became more settled, when the people could breathe again safely and were not exposed to the constant danger of losing either their homes or their lives or both, when the movement of the renaissance awakened the remembrance of a better, wiser, happier, greater, brighter time, when a new court life developed in the palaces and castles, then the old rules of etiquette came in fashion again and new rules were added. Books and pamphlets on table manners were written in which children and those adults who expected to be invited to the court meals were taught how they had to behave at the table. Most of them were composed in verse. In these books the rude methods of cleaning the teeth were brought into discredit. One should not touch the teeth with a knife for two reasons: First, the teeth would be damaged by the contact with iron; second, a person having a knife in his mouth could very easily be pushed and injured. The gums might be corroded and bleed. And, of course, it does not look well. It is even compared with the bad habit of blowing the nose in one's bare hand. A Latin proverb which originated at that time says: *"Qua prandes hora, cultrum male mittis in ora."* It is probably the source of the later German saying: *"Stocher die zeen zu keiner Frist mit messern, weil du im essen bist."* (Do not pick your teeth with knives at any time while you are eating.)

Erasmus Desiderius of Rotterdam, the great philosopher and humanist, in his educational book, "De civilitate morum, Basil 1530," advises, if something has remained between the teeth, not to fetch it with the finger nails as

the dogs and cats do, nor with the napkin, but either with a mastic staff or with a quill or a small bone taken from roosters or chickens (*sed vel lentisci cuspide, vel penna, vel ossiculis e gallorum aut gallinarum tibiis detractis).* It is not only by means of didactic literature that the toothpick was recommended, but also satirical poets at that time thought it advisable to reëstablish the good manners of classicism by means of sarcasm and ridiculing the rude customs of the preceding centuries. The best known of these satires was the book "Grobianus," by Fridericus Dedekind, which was published in 1549. There the author teaches not to clean the teeth in the morning, for yellow teeth look more like saffron and gold which have such a beautiful appearance. He goes on to say: "If meat adheres to your teeth, remove it with the knife or with your hand. You cannot do it as the crocodile does which has its mouth cleaned by a small bird."

> Jamque tuis siquid corrosae carnis inhaeret
> Dentibus, id cultro demere conveniet.
> Cum caro fallacis crocodili in faucibus haesit,
> Alitis exiqui tunc revelatur ope.

(Modern writers, speaking of mannerless people, like to make them use their forks or fingers for toothpicks. Walter Noble Burns, in his "Saga of Billy the Kid," tells this of a New Mexico outlaw: "Lounging regally after meals in front of a restaurant and nonchalantly picking his teeth with his ten-inch blade for the benefit of an admiring populace." And T. S. Stribling, in his "Teeftallow," tells this: "Zed sucked his teeth calmly to salvage the shreds of an orange as he pondered these four possibilities. The prospect of spending a period of time in jail did not even break the sequence of his customary movements to cleanse his teeth. He opened the blade of his jackknife to a right angle with the handle, and with this instrument got at some of the more inaccessible teeth very handily.")

In the seventeenth century, the toothpick became more

and more fashionable in the central and in the western countries of Europe. It soon became a well-known instrument among the better educated class. Already Cervantes, the famous author of "Don Quixote," mentions in his book the toothpick, which is employed there in order to make people believe that the user has had a bountiful meal. The same thought occurs in the German proverb that, "he who picks his teeth must not necessarily have eaten flesh."

Shakespeare likes to speak of the toothpick as of a non-English fashion which the travelers have brought with them from their visit in foreign countries. Benedick, in "Much Ado About Nothing," offers to go to the end of the world; he expresses his thoughts with these words: "I will fetch you a toothpicker now from the farthest inch of Asia." In "King John," too, it becomes evident that the little instrument was not very common then, but seen only in the hands of strangers: "Now your traveler, he and his toothpick at my worship's mess." In the comedy, "All's Well That Ends Well," Shakespeare says: "Virginity, like an old courtier, wears her cap out of fashion; richly suited, but unsuitable; just like the brooch and the toothpick, which we wear not now." This seems to show that wearing the toothpick (Delius says, on the hat) was a transient fashion in the great poet's time. In "The Winter's Tale," finally, one attempts to prove an individual's nobility by pointing to his having a toothpick: "He seems to be more noble in being fantastical; a great man, I'll warrant; I know by the picking on's teeth."

In Francis Beaumont and John Fletcher's play, "The Honest Man's Fortune," one of the characters says:

> You have traveled like a fiddler to make faces
> And brought home nothing but a case of toothpicks.

This quotation again demonstrates that the use of the little implement was considered rather somewhat eccentric

and imported by travelers. In the play, "The Great Duke of Florence," by the English dramatist, Philip Massinger (1584-1640), one of the dramatis personæ says of himself:

> I have all that's requisite
> To the making up of a signor: my spruce ruff,
> My hooded cloak, long stocking, and paned hose,
> My case of toothpicks, and my silver fork
> To convey an olive neatly to my mouth.

To deride pseudophilanthropy, Douglas Jerrold, the English humorist and journalist (1803-1857), said: "He is one of those wise philanthropists who, in a time of famine, would vote for nothing but a supply of toothpicks."

The English language has several synonyms for the toothpick which are now more or less obsolete:

1. Toothpicker.
2. Toothstick. In a manuscript volume of the private accounts of Francis Sitwell of Renishaw, from August 20, 1728, to March 2, 1748, the following entry occurs: 1729, September 6. Disbursed at London (among many other items) a silver toothstick, 8d.
3. Toothscraper.
4. Toothrake. In the glossary edited 1822 by Nares, sub verbo Dentiscalpium . . . Curedent. A toothscraper, or a toothrake.

In the slang of the southern parts of the United States a bowie knife is called toothpick or Arkansas toothpick. We may cite a passage printed in *The Nation* of December 7, 1882, which reads thus: "Things supposed to be required by 'honor' will coarsen as they descend among the vulgar;—the duel will develop into a street or barroom fight, with 'Arkansas toothpicks' as the weapons." It is possibly from this term that the slang name of the Arkansans themselves was derived, who are also called toothpicks occasionally.

In France the toothpick is said to have been introduced by the Spanish minister, Antonio Perez, at the time of King Henry IV, about 1590. It soon became very fashionable.

The material of which it was made was either lentisk or fennel wood. At the table toothpicks were served together with the dessert; they were stuck into the fruits so that they were handy right after the meal. In later times they were passed on a plate or on napkins and, after they had been used, they were either thrown under the table or worn for some time behind the ear for decoration. It is not surprising that in gallant France the toothpick as well as everything else was occasionally employed in the service of love. Antoine de La Salle, in his story of Jean de Saintre, published in 1459, tells us this: "If you will see me," said the dame of Belles-cousines to her hero, "cleaning my teeth with a toothpick (épingle), this will be a sign that I shall like to speak to you."

The famous admiral, Gaspard de Coligny, an ancestor of the German Kaiser Wilhelm, the very first victim of the bloody Bartholomew-tide of 1572 in Paris, when hundreds of Protestants and Huguenots were killed, was known as a man who, even long before the toothpick was fashionable in France, never in his life took this little instrument out of his mouth, be it at the court of Francis I, Henry II and Charles I, be it during the battle, or in the street. When he died, the murderers—was it piety or was it mockery?—put a toothpick in the mouth of the mutilated and violated body.

Rabelais, in his famous satire, says that Prince Gargantua "picked his teeth with mastic toothpicks" *(s'escuroit les dents avecques ung trou de lentisce.* Book I, 23).

The "Connétable de Montmorency" was said always to have a toothpick in his mouth when he had some suspicion against somebody. About 1565, this little verse was in circulation:

De quatre choses Dieu vous guarde:
Des paternostres du vieillard,
De la grand main du cardinal,
Du cure—dents du connestable,
De la mess de l'hospital.

King Henry IV of Navarre paid twenty sous each month for toothpicks. Henry II of France had the goldsmith Gilles Suramond make for him *"un étui d'or garni d'un curedent et d'un cureoreille, tous taillés d'espargne et enrichis de couronnes esmaillés de rouge et de blanc."* The toothpick in possession of the Duke of Burgandy in the fifteenth century was unusually ornate and had an enormous value; in the inventory it is described thus: *"Ung curedent ouquel est mis en œuvre ung de dyamant nommé la Lozenge et une grosse pointe de dyamant et une grosse perle."*

The French philosopher, Montesquieu (1689-1755), tells of a young girl who annoyed a man for about an hour insisting that he buy a package of toothpicks from her. Chateaubriand (1768-1848) knew of a lady who wrote her memoirs with a toothpick which was dipped in watery pine soot. In 1797 Goethe says of the French: "During meals, their postulates are so exact and circumstantial that even the toothpicks are never forgotten."

In Spain, the rays or stalks of the main umbel of bishop's-weed, Ammi visnaga, are used for toothpicks; the plant is also called Spanish toothpick or toothpick-bishop's-weed. The educated Spaniard, says Sachs, undertakes after each course at the table a very lengthy treatment of his teeth with a toothpick and keeps it in his mouth even a long time after meals! This decoration is very becoming to the young ladies; they seldom put it away in the daytime; it serves them to protect their virtue if some one approaches them to steal a kiss. In Sevilla the dancers during the public performances have a toothpick in their mouth as an indispensable part of their costumes and are said to develop particular grace in the manner they hold it between their lips, similar to the grace shown by the Parisian girls when smoking cigarettes.

In Portugal toothpicks are as common and fashionable as in Spain. In Coimbra, where there is a well-reputed

university, beautifully chiseled "palitos de Coimbra," about six to ten inches in length, are used and their manufacture forms one of the most important industries of this town.

Bishop's-weed is employed in the preparation of toothpicks not only in Spain but also by the Greeks, particularly those living in the southern regions of Asia Minor. They say that Prometheus brought the fire from Olympus with a stalk of this plant which they call Narthex. In fact, these stems, of almost a man's height, if completely dry glimmer like a match.

In German literature we find the little instrument mentioned on several occasions. Its name is "Zahnstocher." It was recorded probably for the first time in the dictionary of Martin Mylius, called "Nomenclatura" and published in 1579, where the Latin word dentiscalpium is translated by "Zahnstocher." The famous encyclopedia of Heinrich Zedler, edited in Halle in 1749, defines the instrument thus: "Toothpick is an implement made either of silver or ivory or a pointed quill which is occasionally wound about very nicely with gold or silver wire. With it, that which during meals happens to adhere to the teeth is taken out again, and in order to keep it always clean and to carry it about comfortably one has a steel or silver case or one made of some other metal, in which several such pieces are placed. The toothpick which is in possession of a bride, according to the old Saxon right, forms a part of her personal utensils (which belong exclusively to her and do not pass over into the husband's possession); from this the toothpick case is exempted."

In Wieland's "Adventures of Don Sylvio of Rosalva," the author tells the mysterious story of the fairy Radiante who changes an old green twig into an ivory toothpick, with the condition that it should not regain its former shape until it had served to pick the hindmost molar of an eighty-year-old maid who still is an immaculate virgin.

In Schiller's "Fiesco," the Moor declares: "I cannot be

hung higher than the gallows is." To which Fiesco replies: "No, not on the horns of the moon, yet high enough that you shall look upon the gallows as on a toothpick." On the other hand, some people who are wont to magnify little things may, as a German proverb says, look upon a toothpick as a barn door. Grimmelshausen, in his famous book "Simplicius Simplicissimus," says that many toothpicks together may give a fire, too, which means to indicate that many little things if working together may assume a great importance.

Johann Heinrich Voss, in an idyl named "Abendschmaus," refers to the customs of some people of picking their teeth behind the napkin which they hold before their faces, thus underscoring this not very appetizing act instead of concealing it as they wished. He says there:

> Eagerly looked the physician who, crowned with a festive peruke cloud,
> Hid with the napkin the use of his toothpick. . . .

The Schiller Museum in Marbach possesses a toothpick case of yellow ivory which once belonged to the great poet Friedrich Schiller; on its surface there are two Grecian figures painted white on blue by Dorothea Stock. In the Goethe House in Frankfort a toothpick case of ivory is kept which had been the property of Goethe's mother.

There is a superstition prevailing in the Tyrol which reminds one very much of the Talmudic aversion against the use of reed for toothpicks, and for which also a very similar explanation is offered. The people say there that blades of straw or stalks resembling them should not be employed as toothpicks, for the devil often leaves the demoniacs possessed by him and hides in straw blades; the one picking his teeth with such a blade might become possessed by the devil.

While, according to the account given in this chapter, the toothpick is to be looked upon as a very old implement, the *modern form of the toothbrush* is of very recent date. One

of the first illustrations of it may be found in the book, "Le Dentiste des Dames," by the Parisian dentist, Joseph Lemaire, published in Paris in 1818. We see a young lady in her morning dress, just about to make her toilet. On the table at which she stands there lies a toothbrush near a small box, probably for face powder. This picture is accompanied by the following words: *"Il faut, tous les matins, en se levant, se gratter la langue et se nettoyer les dents avec une brosse qui ne soit ni trop douce, parce que l'une pourrait irriter les gencives, et l'autre ne servir à rien."*

It is because the toothbrush is not older than about two or three hundred years that folklore knows almost nothing about it. It is still regarded as the nobler, less known, more luxurious implement than its little mate, the toothpick. The Russians have a proverb that says: "What good does a toothbrush do him who has no teeth?" They also compare a useless gift to the donation of a toothbrush to a toothless maid.

The Marshall Field Museum in Chicago possesses a number of toothbrushes made of wild boar's bristles. They are used on the Island of Mindanao of the Philippine group primarily to remove particles of betel nut from the teeth, but they also serve as decorations and are fastened to the fronts of jackets.

Before leaving the subject, we may be permitted to add a few notes on what may be called the *folk-zoölogy* of the toothpick. We mean the old story of the trochilus and the crocodile in which, according to Crawfurd, the toilet of the mouth has its legendary origin. Trochilus, or sicsac, or crocodile-bird is a small black-headed plover, Pluvianus ægypticus, of North Africa that often perches on crocodiles and devours their insect parasites. Herodotus, Aristotle, Aelian and Pliny tell its story in much the same way. According to Aelian, "Leeches invade the mouth of the crocodile as it swims with it open, and cause the animal much discomfort; feeling the need of the medical aid of

the trochilus, it swims to the bank and lies there with its jaws agape, whereupon the bird enters and removes the leeches, while the crocodile remains perfectly still so as not to harm it." Pliny thinks that the animal enjoys the titillation of the bird's movements in its mouth and therefore keeps the jaws open to admit the trochilus.

Buffon cites, according to Crawfurd, a traveler who actually saw the bird enter the crocodile's mouth, which closed behind it each time, and opened again after a while for the bird to emerge. Topsel says that the beast reopens its mouth because the bird carries sharp thorns on its head which prick the crocodile's palate; and the modern Egyptian, according to Leith Adams, says that the reminder is conveyed to the crocodile by the horny spurs of the bird, which Brehm identified as the Egyptian plover.

"One can scarcely doubt that the performance is due to the bird's quest for palatable food and not to the intelligent demand of the crocodile for the effective scavenging of its teeth" (Crawfurd). Nevertheless, in a recent issue of the *National Geographic Magazine,* Felix Shay, in an article on an adventurous journey from Cairo to Cape Town, overland, writes: "We saw that strangest of sights, a little bird, the sicsac, inside the open mouth of a crocodile, cleaning its teeth."

While dealing with the folk-zoölogy of the toothpick, we may cite a few instances which would explain the old age and throw a light upon the great popularity of this utensil. We learn from notes in question that even apes can be taught how to clean their teeth with a toothpick. The Arabian writer, Gaubari, tells of a man who had trained an ape so well that the animal could take part in all religious ceremonials of the mosque, and among many other things knew how to employ the siwak. Deutsche Monatsschrift für Zahnheilkunde, of 1895, reports that in a photographic presentation in Dresden a picture was projected in which a monkey cleaned his teeth with a regular toothbrush. And

Hachet-Souplet saw a tame ape who suffered very much from toothache because he had eaten too many nuts, and who therefore tried to remove the remaining food particles from between his teeth with his fingers, an attempt which had not the desired success. An iron staff and a whetstone were placed in his cage and another staff was pointed in front of him. This pointed staff was given the monkey, who instantly used it as a toothpick. He noticed that the staff still was too thick and the thought came to him that he might whet it on the grinder. After one hour's work he had completed an ideal toothpick which he used with great pleasure.

PART III

TOOTHACHE AND ITS CURE

CHAPTER X

GENERAL CONCEPTIONS ABOUT TOOTHACHE

THERE is a little story told in Bosnia of a Turk who saw a child weeping in the street and asked, "Why are you crying?" "A snake bit me," was the reply. "That is nothing! I thought you had toothache," said the Turk and went his way.

This anecdote, although intended as a jest, sufficiently characterizes the great importance attached to the pain resulting from a diseased tooth. We are reminded of the classical remark made by the Roman physician and writer, Aulus Cornelius Celsus, who stated that toothache may be counted among the greatest tortures *(maximis tormentis annumerari potest)*. There is nothing in the world worse than toothache, says a Yiddish proverb. "Do you believe," Claude Tillier exclaims in the story of "My Uncle Benjamin," "that there exists a mental pain which gives you such a torture as does toothache or earache?" He also compares the feelings of a woman who does not love her husband to a toothache which would not leave her for an hour.

Matthias Claudius, the "Messenger of Wandsbeck," in his humorous poem of Herr Urian's travels around the world, speaks of the Mogul, who is a powerful man, immensely gracious and wise, but who is just going to have a tooth pulled. "Is that so," thinks Herr Urian, "has he pain in his teeth in spite of his greatness and riches? What good does it then if one is Mogul? One can have toothache being a common mortal, too."

There is, according to a German saying, only one certain condition which is more tragic than toothache, that is if

you are in love and cannot woo. Unmarried girls, therefore, who complain of pain in their teeth, are teased thus: "It is true that toothache is something horrible, but never mind, being without a husband is still worse than this."

The English, too, know how bad it is to be bothered with bad teeth; "who hath aching teeth hath ill tenants," as their proverbial wisdom taught. Furthermore, a bad tooth infects the whole row; although the tongue and the teeth are quite chummy neighbors in the times of good health, the diseased tooth does not enjoy at all its companion's visit, for any time the tongue touches it a sensation of pain results. (German: *An den kranken Zahn stösst die Zunge an.* French: *Où la dent fait mal, la langue s'y porte.* Italian: *La lingua tocca dove il dente duole.* Latin: *Obsequitur denti super ambula lingula dolenti.* Swedish: *Ae lekir tunga a tanne saarast.)*

"Concentrated is his soul," says Wilhelm Busch, of the poet suffering from toothache, "in his jaw tooth's aching hole."

Shakespeare (Much Ado About Nothing, Act V., Sc. 2, Line 21) says:

> For there was never yet philosopher
> That could endure the toothache patiently.

He could not know, of course, that not so very long after his death the French mathematician and philosopher, Pascal (1623-1662), when tormented by a severe toothache, meditated very intensively on a mathematical problem and, when he had found the solution, discovered that his pain had left him for good. Some hypermodern dentists, disregarding the old saying that "Music helps not the toothache" (German: *Zahnschmerzen lassen sich nicht wegmusizieren),* were reported to play a hormonium or a phonograph in their reception rooms, but unfortunately no information was given about the effect on the victims.

Robert Burns wrote this "Address to the Toothache":

My curse upon thy venom'd stang,
That shoots my tortured gums alang;
And through my lugs gies monie a twang,
With gnawing vengeance,
Tearing my nerves with bitter pang,
Like racking engines!

The one who has ever experienced—and who has not—the same tearing and gnawing, boring and twinging, will easily understand the exorbitant wealth of drugs and charms, of magic actions and prayers that were, and still are, employed by uneducated, superstitious people in order to obtain relief from their sufferings.

The popular diagnosis of the dental affections usually exhausts itself in the term *toothache,* the most prominent and only perceptible symptom being taken for the disease itself. Some people distinguish between "carious" and "rheumatic" pain; the first attribute is employed if there is a visible hollow in the tooth, the latter is used if the ailing organ seems to be intact. The ancient Egyptians, according to the papyrus of Ebers (3500-1500 B.C.), knew besides toothache the "bennut blisters in the teeth" and "uxedo"; the meaning of these words has not been sufficiently interpreted by the expounders; the name uxedo probably refers to an abscess or painful swelling. The Four Tantra (r Gyud bzhi), an Indian work dating from the eighth century of the Christian era, mention six different diseases of the teeth. The Chinese described nine varieties of toothache which is called "Ya-tong," and in addition thereto seven distinct diseases of the gums. The Czechs know two kinds of toothache: the pain that is caused by the hollow (corroded, "vyžraný") tooth, and that which consists in shooting, lancinating sensations ("strile"). The Kongo-Language, according to Bentley, has a special name for toothache in general and one for pain in the front teeth.

In medieval literature toothache is very often spoken of as "gout in the teeth," or "flow in the teeth," the latter

term being undoubtedly derived from the belief that the pain is caused by the presence of ill "humors" in the aching tooth.

The folk etiology of toothache is not as uniform by far as the diagnosis. Very common is the opinion that the cause is to be derived from a "cold." The Tibetans ascribe the bad condition and final loss of their teeth to the effect of the cold and very sharp wind; there is some truth in this belief, for Saunders, who visited the country, says that the wind there peeled off almost all the skin of his and his companions' faces. In Styria, the very frequent caries of the teeth is thought of as a result from the eating of fat food; according to Fossel, this etiologic opinion is very well justified considering the fact that the customary greasy meals are eaten very hot and followed instantly by a drink of cold water. In Beierfeld, Saxony, toothache is given the surname of "fourth-holiday disease," as some people, after taking plenty of sweets during the usual three holidays (Christmas, New Year, Easter, Whitsuntide being celebrated for three successive days), notice on the fourth day, when they go to work again, the bad effects of their feasting, the most painful of which is toothache.

In Norfolk, England, toothache is called the love pain, and the sufferers receive little sympathy.

Like so many other diseases, toothache may be acquired by witchcraft or being affected by the "evil eye." Even if another person complains to you about his pain, you are liable to get it from him so that he is freed from the evil and you are the unfortunate heir. In Brandenburg, therefore, if someone speaks of his toothache, the listener keeps the ache away from himself by saying immediately, "You keep your pain for yourself and complain to the stone."

Another source are the gods and demons and also animals in those places where they are worshiped. So the natives of the Island of Nias, near Sumatra, believe that toothache

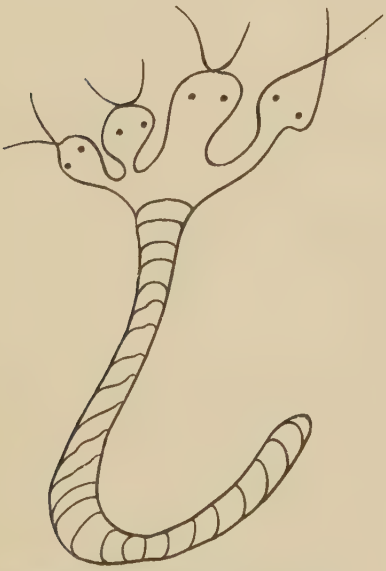
is caused by a certain animal. The old opinion of the demonologic origin of diseases met with among the ancient Babylonians and Assyrians is still found in its unadulterated form in the folk medicine of the Bosnian gipsies. They have a very popular legend, according to which the beautiful fairy queen Anna was compelled to marry the dwarf king Locolica and had nine children, the demons of all existing diseases. One of them is Bitoso, the Fasting, the "least harmful of all." He has the shape of a worm with four heads which penetrate the tissues and produce toothache and earache. Following another version, he has several children who have their particular specialties; one causes pain in the stomach, one headache, one lack of appetite, and one toothache.

If the god or the demon dislikes an individual, he makes him sick. God punished Pharaoh by afflicting the Egyptians with the plague. Zeus and his staff were very liberal with all kinds of ailments, mutilations, metamorphoses, confusions of the mind. One must necessarily pacify them in order to avert their wrath and to be spared. In the Historical Department of the International Hygiene Exhibition in 1911 two jaws with teeth of terra cotta were shown which were offered by the ancient Etruscans to their gods in order to be cured from toothache. As late as in the seventeenth century, the people of Nerike, near Oerebro in Sweden, sacrificed to Thor on certain rocks against toothache. The Chuvashes, a Finnic people living on both sides of the Volga River in the governments of Novgorod, Kazan, Simbirsk and in the Republic of Orenburg, invoked in toothache the help of the god of health, Irich, and offered him pap and doughnuts. In Krebel's time, about 1850, some Esthonians still believed in "sacred groves." If they suffered from toothache, they pacified the gods by carrying leaves or branches from there with them.

In Samoa is a rule which forbids persons who have been in contact with the dead to touch food with their hands.

Those who attended the deceased were most careful not to handle food, and for days were fed by others as if they were helpless infants. Baldness and the loss of teeth were supposed to be the punishment inflicted by the household god if they violated the rule.

Among the Yabim of German New Guinea, when the relations of a murdered man have accepted a bloodwit instead of avenging his death, they must allow the family of the murdered to mark them with chalk on the brow. If this is not done, the ghost of their murdered kinsman may come and trouble them for not doing their duty by him; for example, he may drive away their swine or loosen their teeth.



Bitoso the Fasting. The Toothache-Demon of the Bosnian Gipsies.

As the gods are responsible for toothache and consequently also for its relief, they expect that their help will be rewarded. Nothing in the world is gratis but death, and even death is paid for with life. The gods are good business men and demand their pay for everything they deign to do for us helpless beings. In Upper Austria, in Würzburg, in Moravia, there are places to which people affected with toothache make a pilgrimage. The Ethnographic Museum in Vienna possesses the image of a mandible with teeth made of white wax, which was offered as a sacrifice. Some of these imitation jaws, on account of their fragility, are supplied with a cross-bar which holds them in the right position and prevents them from shrink-

ing. In former times such wax mandibles were also deposited over some grave in the cemetery.

All these opinions about the origin of toothache are by far excelled by the very old belief spread all over the earth that worms are responsible for the ailment. We have learned that the Bosnian gipsies gave even their god of toothache the shape of a worm. The Roman writer, Scribonius Largus, who lived in the first century of the Christian era, was the first author who mentioned worms as being the cause of bad teeth, but it is known that far back in the times of the domination of Egyptian culture this idea was neither uncommon nor new. In Babylonia toothache was supposed to be caused by a demon that was identified with a worm. This is made clear by the following text:

After Anu (had created the heavens),
The heavens created the earth,
The earth created the rivers,
The rivers created the canals,
The canals created the marsh,
The marsh created the worm,
Then came the worm weeping before Shamash;
Before Ea came her tears:
"What wilt thou give me for my food?
What wilt thou give me as mine to destroy?"
"I will give thee the ripe figs and soft pomegranates."
"Me! What are these ripe figs to me, and soft pomegranates?
Lift me up, between the teeth and the jaw-bone set me,
That I may destroy the blood of the teeth,
And ruin their strength,
Grasp the prong and seize the root."

The worm etiology of toothache was considered a scientific fact by many noted physicians and medical writers during the Middle Ages, and as late as in the seventeenth century, men like Johannes Schultes (Sculthesius) of Ulm or Nicolaus Tulp of Amsterdam still were convinced of the truth of the worm theory. It was reserved to Pierre Fauchard, the great founder of modern dentistry, to cast doubts on

its reality. "He admits," says Taylor, "the possibility of them, but states that he has never seen them, and if they do exist they are not the cause of caries, but the eggs of insects may have entered carious cavities and there hatched and produced worms. Although Andry relates seeing very small worms with a powerful glass, Fauchard states that he employed the same means, but could not see them. Thus he sets forever at rest this foolish superstition, so long indulged by the people of those times in regard to worms in the teeth as a cause of dental ailments. Perhaps it is only as a matter of courtesy toward the many authors who preceded him that he admits their presence at all." Fauchard's work, "Le Chirurgien Dentiste," was published in 1728. Already in 1683 the Dutchman, Antoni Van Leeuwenhoek, had discovered microörganisms in tartar scraped from between the teeth. Is it not remarkable that just at the time when the fancied worms in the teeth were discredited by science, the first steps were done in dental bacteriology which began with the discovery of Van Leeuwenhoek's bacteria [*animalcula quædam iucundissimo modo se moventia*] and reached its culminating point in the incomparable studies of Willoughby Dayton Miller?

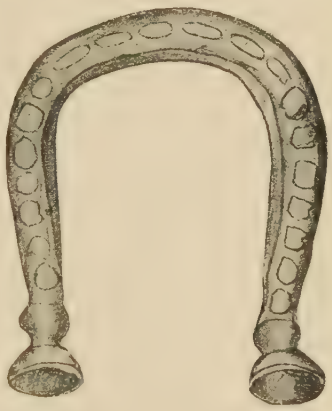
Though science has abandoned the toothworm in the beginning of the eighteenth century, it still exists in the popular belief. In India, according to Crooke, women of the gipsy tribes are noted for their charms to take out the worm which causes toothache. Wiedemann tells us the secret of those "who fetch the worm from the tooth" in Arabia. Chinese "dentists" wander about in the streets with chests full of medicines buckled to their backs; the patient is given some medicine which he is supposed to apply to his face and then he has to cough, which would make the worm fall out. While the patient coughs, the dentist is at work. He has with him small strips of fine white paper, about one-tenth of an inch in length, which so much resemble worms that the not suspicious layman

could not tell them from real worms. He hides them in his sleeves or under his finger nails and while he looks for the worms in the patient's tooth he drops the paper strips into his mouth and then takes them out triumphantly from there, pretending that these are the worms that had produced the toothache.

In Madagascar the sufferer from toothache is described as being marary olitra, *i.e.*, poorly through the worm.

The Algonkian Indians speak of the affliction as "mosewabite," a worm in the tooth.

In all European countries the uneducated people believe in the worm etiology. They have their good reasons, too. When a carious tooth has been pulled, they see the pulp hanging down from the root, or if they break the extracted tooth in order to find the worm their pathologic-anatomical attempt is crowned with success; they find the pulp, which to them appears as being the worm they sought for.



Imitation Jaw of White Wax, Offered as a Sacrifice.

The inhabitants of the Orkney Islands call toothache simply, "the worm." In Manx, the language of the people of the Isle of Man, the plural form of beisht (a beast), beishtyn, is used for the toothache, from the opinion that the pain arose from an animal in the tooth, and in Gaelic, the Celtic language of the Scotch highlanders, cnuimh, a worm, gives half the name of toothache, which is cnuimh fhiacall.

The most common popular remedy against worms in the teeth is the fumigation with henbane, of which we shall speak in a following chapter. The worms naturally play a very important rôle in the toothache charms, and were a

good source of income for the quacks in the Middle Ages.

In this connection we may be allowed to quote a passage of Philip Massinger's "Parliament of Love," which refers to the "worm causation" both of toothache and love:

> "I am troubled
> With a toothache, or with love, I know not whether;
> There is a worm in both."

And in Shakespeare's "Much Ado About Nothing" (3, 2) we read the following dialogue:

> Don Pedro: What! sigh for the toothache?
> Leonato: Where is but humour, or a worm

CHAPTER XI

THE PRINCIPLES OF POPULAR TOOTHACHE CURES

A MAN was asked to tell which, in his opinion, was the most widely distributed occupation. Without hesitation, he replied that there are more dentists in this world than representatives of any other vocation. When challenged to prove his statement he tied a handkerchief round his face and sat down at the entrance of a well-frequented church on a great holiday, sighing and moaning and pretending to have a terrible toothache. Everybody who entered the church stopped at the sight of the alleged sufferer and gave him advice as to what he should do to be freed from his pain. At this occasion he not only demonstrated the truth of his "statistics," but also became aware of the fact that he received from the people as many different recipes and prescriptions as there were advisers. This story, told and retold for generations in this or similar form, tends to show the enormous number of remedies existing for the popular relief of dental irritation. There is indeed a legion of medicines, a host of magics and charms, a startling multiplicity of all sorts of procedures intended for the cure of this evil. At first glance these innumerable cures appear bewildering, a Proteus of many shapes, a therapeutic tower of Babel. It is, as a matter of fact, not an easy task to reduce to a few simple formulæ all the dental remedies as employed among the various nations and tribes.

If we do attempt a classification, we find that all three kingdoms of nature are well represented in folkloristic treatment of toothache. Plants and their products occupy the largest territory. Roots and leaves, stalks and umbels,

blooms and filaments, juices and resins are employed in their natural condition, or dried and pulverized, or in the form of infusions or decoctions in water, wine, vinegar, or milk. Next in order of frequency are the animals, their organs and excretions. From the lion down to earthworm and gallflies, they contribute their share to the dental folk-pharmacopœia. Homo sapiens, standing at the top of creation's pyramid, does not withhold his own organs from dental cures; to the phytotherapeutics and zoötherapeutics he adds the anthropotherapeutics of toothache. Inorganic substances, finally, are found to be far less popular than the other agents. All these remedies may be applied directly to the aching tooth; they may be administered to the tooth itself or to the gums, they may simply touch the diseased organ or be rubbed on it and on its surroundings, or inserted in the cavity of a hollow tooth. Their indirect application to the cheeks, ears, or nostrils, and even to more distant places, such as upper arms, elbows, forearms, wrists, fingers, legs and toes which are touched or rubbed or tied about with the agent, is in most cases supposed to have a "derivative" effect, drawing or diverting the morbid action from the bad tooth to another part. Some of the remedies, particularly organs of animals and human teeth, are worn as amulets and thought to be infallible safeguards against toothache.

There are various forms of amulets against dental disease. Bishop Joseph Hall (1574-1656) speaks of them as "Paracelsian characters for the toothache," by which a superstitious man may be easily recognized. They were also called "virtues" by the believers. Such a virtue is recorded in the Romaunt of the Rose (Complete Works, ed. Skeat, Vol. I, p. 139), where Chaucer's version reads:

> Rychesse a girdel hadde upon,
> The bokel of it was of a stoon
> Of vertu greet, & mochell of might;
> The mourdannt, wrought in noble wyse,

Was of a stoon ful precious,
That was so fyn & vertuous,
That hool a man it coude make
Of palasye, & of *tooth-ake.*

A cord round the loins is worn to ward off toothache in England. The Giliaks, a hunting and fishing tribe inhabiting the lower Amur and the coast of the Sea of Okhotsk, wear the wooden image of a man's head, the lower part of which (chin and jaws) is tied about with a rag.

Another form of amulets or talismans consists of written slips which are worn about the neck, or on the chest, or in the pocket. Written and spoken charms are a powerful remedy against toothache and are in use everywhere, particularly in the countries inhabited by the White Race. A great many of the invocations are addressed to the moon, to running water, to Saint Peter, or to Saint Apollonia, the patroness of toothache. Many of the toothache charms have the intention of transferring the pain from the individual to some other subjects, such as trees, stones, walls, doors, water, or the ground.

These originally heathen procedures were often converted into Christian ceremonies. Thursday is the day of the god Donar, or Thor. On this day magics were more efficient than during the rest of the week. The sanctity of the old-Germanic day was transferred to Maundy Thursday, thus giving the charm a Christian significance. The one who fasts on this day is protected against toothache in western Germany and the northeastern portion of France. Good Friday is the very best day for getting rid of toothache. In Silesia the people suffering from toothache should comb their hair on Good Friday, burn the hair which had fallen out while combing, and inhale the fumes thus produced. In Thuringia, if you suffer from bad teeth, you should go to hear the holy mass and on your way back have some one bring you some food of which you must eat. It often helps if you simply draw a cross

in the air with your finger, or bite your teeth together while the mass is read, and say: "Os non comminuetis exeo!" or if you make a cross with your tongue every morning. In County Wicklow, Ireland, the points of three smoothing irons are pointed three times in the name of the Trinity at the painful tooth—for then, sure enough, the pain vanishes. The Trinity is invoked in a very great number of toothache charms.

Sometimes the folk-prescriptions against toothache seem to be so strange that it almost may appear that they might have been intended as jokes or as a humorous criticism of superstitious magics. Yet they are meant to be taken very seriously. To secure yourself from toothache you will be told in Sussex to be careful always to put on the right stocking before the left, and to put the right leg into the trousers before the left. But in Shropshire, for instance, exactly the contrary is enjoined. In Swabia you should leave the bed in the morning with the left foot first and also put on the left stocking, the left shoe, the left sleeve before the right; at night you should take off your clothes in the same order and go to bed with the left foot first. In the northeast of Scotland it is thought a good cure for toothache to go between the sun and the sky to a place where the dead and the living cross, and lift a stone from it with the teeth.

The most frequent thing people do if they have pain in their teeth is that they wrap a handkerchief or a towel round the cheek. This towel is in cartoons and in so many paintings the chief characteristic of one suffering from toothache. In Franconia, the dirtier the towel, the better the effect will be on the teeth.

To hold whiskey in your mouth is another very popular remedy. There is an Hindu anecdote, according to which an elephant had a terrible toothache. He was very bright and knew what he had to do. He ran against a full barrel of beer and broke it, then became drunk from indulging

in its contents and forgot his toothache. The Talmud tells the same story, the hero of which, however, is an ox instead of an elephant.

Dental surgery is known even to some of the most primitive peoples in the form of extraction and in that of cauterization. Artificial teeth and complete dentures are not very common, but were known to the ancient Egyptians, Etruscans, Hebrews, Grecians and Romans, to the medieval Arabs and Hindus, and to the Eskimos, Tibetans and Dyaks of to-day.

The following nine chapters deal exhaustively with all these methods of popular dental therapeutics.

CHAPTER XII

THE PLANT TREATMENT OF TOOTHACHE

Aloe. The inspissated juice of the leaves of Aloe Perryi and other species of the aloe family is said to have a good effect upon all affections of the mouth and gums. In Greece it was used against toothache in combination with wine and honey.

Angelica. In Styria, toothache is treated with an infusion of the aromatic root of Angelica archangelica, with which the mouth is rinsed.

Apple, Pirus malus. The Polish Jews, in the case of toothache, eat an apple which, fixed on the point of a lulab (a green palm branch carried at the Feast of the Tabernacles), was roasted over an open fire.

Asafetida. The Czechs fumigate with this plant in order to get rid of toothache.

Asparagus. The decoction of the root of Asparagus officinalis, applied to the aching tooth, was considered very helpful by the ancient Greeks. The same effect was ascribed to the seeds if taken internally. Asparagus juice was recommended by Pliny to strengthen weak teeth.

Asphodel. The juice obtained from the root of Asphodelus albus, according to Dioscorides, relieves toothache if instilled into the ear opposite to the side of the aching tooth.

Balm-Mint. The decoction of Melissa officinalis, used as a mouth wash, is good for toothache.

Bamboo. An infusion of the leaves of the East Indian male bamboo, Dendrocalamus strictus, is inhaled by the natives in the case of toothache.

Banana, Musa sapientum. The treatment of toothache among the Australian negroes of Victoria consists in banana cataplasms.

Barberry. Lycium, the extract of the wood or roots of different species of Berberis, was employed by the Greeks in the cure of ulcerated gums.

Bead-tree. An infusion of the leaves of Melia composita is inhaled by the natives of East India.

Betony. A decoction of the blossoms of Betonia officinalis with sage and alum in vinegar is kept in the mouth by the Slovenes as hot as the patient can endure.

Birch, Betula. In the environs of Kursk, Russia, a piece of sugar is soaked with the essence of the leaf buds of the birch, Essentia gemmarum betulæ, and bitten with the ailing tooth; or a piece of cloth folded six or eight times is moistened with the essence and applied to the tooth, being kept between the cheek and the gums.

Birthwort, Aristolochia, was used in diseases of the teeth and gums, usually combined with iris and honey.

Blackberry, Rubus fructicosus. A mouth wash containing blackberry juice relieves toothache in Styria. It was used for the same purpose in Greece and Rome, where also the leaves were chewed to strengthen the gums.

Box-tree, Buxus. An oil and an extract of boxwood is believed to be good for toothache. Cotton soaked with the oil is used in Bohemia to fill carious cavities.

Bryony, Bryonia, is employed in Bohemia for the fumigation of toothache.

Buttercup. The root of Ranunculus ficaria served the ancient Greeks against toothache, but it was said to crumble if applied directly to the tooth. According to Krebel, the Russians use Ranunculus aquatilis as a "derivative" by placing it on the palm. In western Bohemia the root of Ranunculus acer is tied to the little finger on the side of the ailing tooth.

Cajuput-tree, Melaleuca cajuputi. In Oldenburg the

people rub the gums around the aching tooth with the well-known oil of cajuput.

Caltrop. Leaves and fruits of the land-caltrop, Tribulus terrestris, were believed to heal diseased gums.

Camomile, Anthemis nobilis. Toothache is treated in Swabia with roasted camomiles which are administered in small bags. In other parts of Germany a decoction of the plants mixed with vinegar is employed. Or camomile flowers are cooked in milk and filtered through a towel on which saltpeter was strewed; this liquid is kept in the mouth so that the diseased tooth is covered with it, and then it is spit out. This procedure must be repeated several times. In western Bohemia warm oil of camomile is instilled into the ear on the side of the aching tooth.

Camphor-tree, Camphora. The Bavarians place a small piece of camphor, wrapped in cotton, in the ear against toothache.

Caper-bush. The seeds of Capparis spinosa relieve toothache if boiled with vinegar and used as mouth wash. They are also helpful if bitten to pieces and chewed upon.

Carnation, Caryophyllus. Oil of cloves, Oleum Caryophylli, is a very common folk-remedy against toothache. It is used in all European countries. Flügel mentions its being employed in Franconia, Fossel in Styria, Hovorka and Kronfeld in Upper Austria, Bohemia and Slovakia. With the seeds, carious cavities are filled in Dalmatia, Croatia, Slovakia and Bohemia.

Cashew. In East India carious cavities are filled with the seeds of Anacardium. The seeds, called "elephant's lice" in Germany, are worn around the neck in Swabia as a safeguard against toothache.

Cedar, Cedrus. The cedar resin if placed in the carious cavity destroys the diseased tooth, according to Dioscorides. It has the same effect if dissolved in vinegar and used as a mouth wash.

Celandine, Chelidonium majus, of the poppy family, has

a narcotic milky juice which is instilled into the hollow tooth in Bavaria. In the German part of Bohemia the plants are plucked in the month of May, minced, and put in a glass of water which is for some time exposed to sunlight; then the water is filtered and heated and, if kept in the mouth, is believed to cure toothache.

Chameleon. The decoction of the root of black chameleon, Carthamus corymbosus (its Greek name is "Oulophonos" or gums-killer), relieves toothache as a mouth wash. If the heated root is applied directly to the aching tooth with a slate-pencil, it destroys the tooth.

Chinaberry-tree, Melia azedarach. An infusion of its leaves is inhaled by the natives of East India.

Cinnamon, Cinnamomum zeylanicum. Oil of cinnamon is met with very frequently in the popular toothache-apothecary. In Germany a few drops are put on cotton and applied to the tooth. The same is done in Slovakia and in Dalmatia.

Cinquefoil. The decoction of the root of Potentilla reptans reduced by boiling to one-third its volume and kept in the mouth, has the power of relieving toothache. Both Dioscorides and Pliny recommended it very highly.

Clubmoss. A decoction of the common clubmoss, Lycopodium clavatum, in beer is used as a mouth wash in the case of toothache by the Esthonians.

Colocynth. The fruits of Cucumis colocynthis furnish a mouth wash against toothache if completely emptied and loamed on the inside, whereupon vinegar and natron are boiled in them, and the whole dissolved in water.

Coltsfoot. The leaves of Tussilago petasites sive Petasites albus, placed on the cheek with their white and ribbed surface, have the same effect as a moist cataplasm and cure toothache in Bavaria. Höfler believes that this custom is very old and that it might have been the cause of the German name of the plant, Huflattich, this being a combination of Old-High-German hiûf or hûfel (check), and attich.

Cork-oak, Quercus suber. In Styria a cork is used as a mechanical remedy against toothache in that the aching tooth chews upon it.

Cress. The root of the garden-cress, Lepidium sativum, was believed by the Greeks to relieve toothache if tied about the neck.

The Salernitan School (eleventh century) teaches:

I.

The garden-cress juice heals the falling out hair,
The pain of the teeth and the scales on the skin.

II.

The water- and garden-cress, if the juice is employed,
Produces new hair and makes it grow promptly,
Gives relief to the teeth and nourishes them,
Helps those who have scales or a rash on the skin.

Cucumber. The decoction of the root of squirting cucumber, Ecballium elaterium, served as a mouth wash against toothache. A decoction of cucumber juice was recommended by Pliny for the same purpose.

Daisy. The Slovaks place white daisies, Chrysanthemum leucanthemum, crosswise upon the elbow of the arm opposite to the side of the aching tooth.

Dill. In Prussia the mouth is held over a hot infusion of wild dill, Anethum, and the steam inhaled.

Dittany. The Slovaks fumigate in the case of toothache with bastard dittany, Dictamnus fraxinella.

Dock. The roots of the yellow dock, Rumex, boiled in wine, relieve toothache as a mouth wash.

Elder, Sambucus. In Bohemia elder juice is taken if the toothache is supposed to have been caused by a cold. In Denmark, too, the elder is good against toothache.

Elecampane, Inula Helenium, is used by the Czechs to fill carious cavities.

Erica is fumigated by the Czechs against toothache.

Flax, Linum usitatissimum. The Swabians, in case of toothache, sleep on a pillow filled with linseed.

Fern. The decoction of the male shield fern, Filix mas, with a number of other ingredients is considered a very good remedy in Germany. To bite the first seen fern that appears in spring off by the ground is said, in Cornwall, to cure toothache and to prevent its return during the remainder of the year.

Fig, Ficus carica. The juice of the wild and domestic fig helps in toothache if instilled into the cavity. A fig cooked in milk and kept in the mouth is considered useful in Styria and in Swabia. In Bavaria it is administered to ulcerated gums. The Franconians apply a fig to the cheek of the aching side. See also under Silphium.

Galbanum, Albetad, a fetid yellowish or brownish gum resin derived from certain Asiatic plants, mostly species of Ferula, relieves toothache in the Orient if the gums are rubbed with it or if it is applied to the carious cavity.

Garlic, Allium sativum. Garlic was at all times and almost everywhere in those countries where it grows, extensively employed in the treatment of toothache. It was administrated either directly to the tooth or as a "derivative" to the ear, the hand, or other remote parts of the body.

In the Talmud, Rabba bar Rab Huna advised the following remedy "against the teeth": Place a snip of garlic ground with oil and salt upon the thumb nail of the ailing side and apply it to the edge of the jaw (the gums); be sure and surround the garlic with dough and protect thus the flesh, for otherwise a white scurf might be produced.

The ancient Greeks considered a decoction of garlic together with resinous pine wood and incense a good remedy if kept in the mouth.

In Styria garlic is cooked in vinegar and kept in the mouth, or it is tied to the wrist ("the pulse") together with salt on the side where the aching tooth is located. In Upper Bavaria it is peeled and placed in the ear "where it

works as a derivative by means of its sulfur-allylic contents." Kantz reports from Galicia that a woman there used against toothache embrocations with garlic, pepper, rum and spirit of menthum, which resulted in a diffuse external otitis. The Bavarians, too, wrap a garlic snip in cotton and put it in the ear; the same is done by the Slovaks and by the Czechs, who also rub the gums with garlic.

The local application of garlic to the aching tooth is as common as its auricular administration. Pliny tells that the Romans filled carious cavities with garlic. To-day the Roumanians, the Czechs and the Ruthenians still fill their hollow teeth with it.

A favorite prescription used by the Chinese reads as follows: Roast a bit of garlic and crush it between the teeth; mix it with chopped horseradish seeds or saltpeter; make of this a paste with human milk; form pills, and introduce one into the nostril on the opposite side to where the pain is felt.

Ginger, Galangal, Radix galangæ, is used in Russia in the cure of toothache. A little of the powder is put in a glass of whiskey or rum, which is kept in a warm place for about half an hour; then the infusion is stirred with a piece of cotton, so that a part of the powder adheres to the cotton which, finally, is applied to the aching tooth. Ginger is a very common ingredient in mouth washes.

Globeflower. The root of Trollius Europæus is scraped off by the Bavarians and tied to the forearm where it produces blisters, thus acting as a "derivative."

Ground-ivy, Glecoma hederacea, is used in Germany for the treatment of toothache. Hovorka and Kronfeld quote a charm connected with it. When the plant is administered, these words must be spoken: "When Saint Peter had severe toothache, the Lord said to him: Take three ground-ivy plants and have them hover about thy mouth."

Hartwort, Tordylium maximum. An old English pre-

scription says: For toothwark, if a worm eat the tooth, take an old holly leaf or one of the lower umbels of hartwort, and the upward part of sage, boil the doles in water, pour into a bowl and yawn over it, then the worms shall fall into the bowl.

Hay. A bath in water to which "hay-flowers" were added is a remedy against toothache.

Hazel-bush, Corylus avellana. Some recommend in England a double hazel-nut to be carried in the pocket against toothache.

Hellebore, Helleborus niger, Christmas rose, relieves toothache if cooked with vinegar and used as a mouth wash.

Hemp, Cannabis sativa. The Czechs treat toothache by rinsing their mouths with a decoction of hemp seeds.

Henbane, Hyoscyamus, Jusquiam. This plant plays a very important part in the popular treatment of toothache. From the earliest time of civilization until to-day it was employed in various forms by all nations in whose countries the plant grows. All three varieties, Hyoscyasmus niger, albus, and aureus, are used.

The root cooked with vinegar and used as a mouth wash was believed to cure toothache by the ancient Greeks, as reported by Dioscorides. Celsus mentions the alcoholic extract of the root as a commendable remedy. *("Hyoscyami radix vel in posca, vel in vino mixto coquitur, sic, ut paulum his salis adjiciatur.")* In various regions of modern Greece henbane stalks are smoked like tobacco against toothache; the same method is prevalent among the Swabians. In Bavaria, if the gums are swollen, the mouth is rinsed with a warm decoction of jusquiam, linseed, mallow leaves and honey. Infusions of the plant are used by the Czechs for the same purpose. In Roumania the carious cavity is plugged with henbane. Thorndike mentions among other medieval remedies against toothache vinegar in which a root of jusquiam was boiled; he also reports the belief that a tooth may be easily extracted after the application of a hot

root of jusquiam to its roots; but beware not to touch the other teeth or they will fall out, too.

The extensive use of hyoscyamus in the cure of diseased conditions of the teeth is due to the opinion that toothache is caused by the presence of worms in the aching tooth. The first mention of the supposed effect of henbane upon the worms is found in the writings of Scribonius Largus, who lived in the first century of the Christian era. He suggested that if the seeds of hyoscyamus be burned on charcoal and the fumes inhaled, they would cause the worms to fall out from the teeth. Says J. A. Taylor in his "History of Dentistry": "It is a noteworthy fact that the seed buds of henbane, when burned, form an ash that much resembles worms, and as the drug has a narcotic effect that probably soothed and relieved the pain, it is no wonder that the ignorant populace of that time readily gave ear to such plausible humbug." Guy de Chauliac (1300-1360), one of the most noted surgeons of the Middle Ages, still advised fumigations with henbane mixed with goat's tallow in order to "drive out the worms." The medieval quacks, moving from place to place, made full use of the worm superstition. They threw the seeds of henbane upon open coal fire or upon a hot metal plate and when, under the development of the specific hyoscyamus fumes and their empyreumatic odor, the dark seed shell burst and the light wormlike bud appeared, they had the patient inhale the fume through a funnel and showed him the "worms" which, they pretended, had been removed from the aching tooth.

An old English prescription says: For tooth worms, take acorn meal and henbane seed and wax, of all equally much, mingle these together, work into a wax candle and burn it, let it reek into the mouth, put a black cloth under, then will the worms fall on it.

Fumigations with henbane are still common in Swabia, in Bohemia, among the Slovaks and Ruthenians. Fossel reports them from Styria, Roth from Oldenburg, Höfler

from Upper Bavaria. They were highly recommended by the Salernitan School; the Regimen Sanitatis Salernitarum (eleventh century) contains the following verse:

> Sic dentes serva, porrorum collige grana,
> Ne careas thure cum hyoscyamo ure,
> Sicque per embotum fumum cape dente remotum.

Follows, an English version of 1607:

> If in your teeth you hap to be tormented
> By meane some little wormes therein to breed,
> Which pain (it need be tane) may be prevented,
> By keeping cleane your teeth, when as you feede;
>
> Burn Francomsence (a gum not evil sented),
> Put Henbane unto this, and Onyon seed,
> And with a funnel to the tooth that's hollow
> Convey the smoke thereof, and ease shall follow.

Holly, Ilex aquifolium. See under Hartwort and Thistle.

Hop, Humulus lupulus. The Bohemians fill carious cavities with oil of hop. The Magyars treat inflammation of the gums with a mouth wash which they prepare by boiling hop and privet in wine.

Horse-radish, Cochlearia armoracia. The Russians scrape the root of horse-radish and apply the scrapings to the aching tooth.

Houseleek. In Swabia the juice obtained from the leaves of the common houseleek, Sempervivum tectorum, heals bleeding gums.

Hyssop. If cooked with vinegar, hyssop cured toothache in Greece and in Rome. In Styria a fluid containing hyssop has the same effect.—Hyssopos of the Grecians was, according to some authors, Origanum syriacum or smyrnæum, according to others, Hyssopus officinalis, or Teucrium pseudohyssopus. See also under Silphium.

Iris. The Russians make a mouth wash of the root of Iris dichotoma, which is used in the treatment of toothache. The Mongolians of Taurida, too, employed the root which they called "chaitshi," against toothache. The root of the

yellow iris, chopped up and chewed, is said to be in Argyleshire, Scotland, a cure against the same affliction.

Ivy. The berries of the umbel of Hedera helix, finely pulverized and heated with oil of rose in a pomegranate shell, relieve toothache if instilled into the ear opposite to the side of the aching tooth.

Juniper. The branches of Juniperus sabina are used for fumigation in toothache by the Czechs. Oil of juniper is administered to the carious cavity by the Russians.

Lady's thumb, Persicaria urens, is moistened with cold water by the German inhabitants of western Bohemia and applied to the cheek until it becomes warm and finally buried in a dung hill.

Leadwort, Plumbago scandens. See under Wake-robin.

Lemon, Citrus medioa. Lemon juice and lemon slices are known in folk-medicine as remedies against toothache.

Lentisk, Pistacia lentiscus. With its concrete resinous exudation known as mastic carious cavities are filled in the Orient.

Licorice. In East India the natives suffering from toothache chew a piece of Glycyrrhiza glabra.

Lily-of-the-valley, Convallaria majalis. The root was used in Greece and in Rome for the preparation of a mouth-wash which was considered helpful in toothache.

Linden, Tilia. The Russians employ oil of linden in the treatment of toothache.

Mallow, Malva. A warm decoction of the leaves serves the Bavarians as a mouth wash.

Marigold, Calendula, officinalis, is used by the Bohemians for fumigation in the case of toothache.

Marjoram. The wild marjoram, Origanum vulgare, and the sweet variety, Origanum majorana, furnish an oil, Oleum origani or Spanish hop oil, which is known as a remedy against toothache. The decoction of the plant is used in Germany together with other ingredients for the relief of pain in the teeth.

Marshmallow, Althæa officinalis, cooked with vinegar, relieves toothache.

Masterwort, Imperatoria ostruthium, which was formerly given the title of "divinum remedium" (divine remedy) because of its supposed success in a wide circle of complaints, was used as a mouth wash against toothache, after being boiled with water, wine or vinegar.

Mistletoe, Viscum album, was thought to be good against toothache in England.

Moss, Muscineæ. In Swabia the people believe that moss which grows in the cemetery and particularly on old skulls relieves toothache if tied to the cheek.

Mulberry, Morus. The decoction of the rind and leaves is useful as a mouth wash in toothache. At the time of wheat harvest the Greeks dug a hole around the root and cut it open; the juice flowing out of the root was dried until it became a hard mass and was highly estimated as a remedy against ailing teeth.

Mullen. The decoction of Verbascum thapsus relieves toothache as a mouth wash. Another plant of the same family, which was called "arktion," either Verbascum linnense or Verbascum ferrugineum, has the same healing power if its roots and seeds are cooked in wine and the mouth rinsed with the decoction.

Myrrh, Myrrha, a gum-resin obtained from Commiphora myrrha, makes the teeth and gums firm if used as a mouth wash together with wine. Tincture of myrrh is a very common house remedy, a few drops being administered to carious cavities on a small piece of cotton.

Myrtle, Myrtus communis. Myrtle wine was employed in Greece against swollen gums.

Nettle, Urtica. In Russia a mouth wash is made of an infusion of nettle to cure toothache.

Nightshade. The bark of the woody nightshade, Solanum dulcamara, cooked in wine and kept in the mouth, relieves toothache.

Nutmeg flower. The seeds of Nigella sativa cooked with vinegar and resinous pine-wood help against toothache if used as a mouth wash.

Oak, Quercus. The leaves boiled with water and vinegar and kept warm in the mouth were thought to be of help in Bavaria.

Oats, Avena sativa. The Slovaks apply warm oats, sewn in a small bag, to the aching cheek.

Oenanthe, of the Apiaceæ family, in combination with honey, is supposed to heal bleeding and ulcerated gums.

Olive, Olea. Oil of unripe olives strengthens the teeth if kept in the mouth; it is called Omphakion by Dioscorides. Oil of wild olives is used as a mouth wash for the cure of ulcerated gums and to strengthen the teeth. The sediment remaining after pressing olives to obtain oil is an effective toothache remedy.

Onion, Allium cepa. Onions cooked in vinegar are a not very appetizing toothache remedy in Styria. In Oldenburg a slice of onion is applied to the ear on the side of the aching tooth. The Czechs rub the gums with onion to relieve toothache. Onions in the treatment of diseased teeth are mentioned already in the Egyptian papyrus of Ebers.

Paprika, Capsicum annuum. The Roumanians plug the carious cavity with paprika.

Parsley, Petroselinum. According to Thorndike, a root of parsley was hung from the neck in the Middle Ages as a talisman against toothache.

Parsnip, Peucedanum officinale. The juice instilled into the cavity was believed to relieve the pain in Greece.

Pellitory-of-Spain, Anacyclus pyrethrum, is next to henbane the most popular plantar toothache remedy. The root was already in use among the ancient Grecians as a mouth wash cooked in vinegar. Celsus, too, recommends it in his book. Höfler, who speaks of its use in Bavaria, says that it was extensively employed in the Middle Ages; he quotes a medieval author who writes this: "It stops the pain

of the teeth; things that are cold may be warmed with the root." In Styria the mouth is rinsed with an infusion of the root. The Bohemians fill the carious cavity with a piece of the root.

Pennyroyal, Mentha pulegium, mixed with wine, honey and salt, or with wine and honey alone, or with wine and salt in equal volumes, heated in an earthen jar, is very good for toothache.

Pepper, Piper nigrum, is very often employed to fill carious cavities, as is the case in Styria, Upper and Lower Austria, Galicia, Roumania, and Hungary. In Bavaria two parts of sugar and one part of ground pepper are heated in a spoon on the open fire and stirred until they form a tough dough with which the carious cavity is filled.

Periwinkle. The leaves and stalks of Vinca minor, of the Apocynaceæ family, were chewed in Greece to obtain relief from toothache.

Pimpernel. The juice obtained from the seeds and leaves of the scarlet pimpernel, Anagallis arvensis, cures toothache if administered to the nose. It must be placed in the nostril opposite to the side of the aching tooth.

Pine tree, Pinus. The bark and the leaves are cooked in vinegar and drunk in case of toothache; also the finely sliced chips, cooked with vinegar, help if applied directly to the ailing tooth. The Kolushes in Alaska apply heated pinecones to the cheek in the case of toothache.

Plane tree, Platanus. The bark cooked with vinegar formed a mouth wash against toothache.

Plantain. The juice obtained from the leaves of Plantago media was drunk by the Greeks against diseased gums; the root was either chewed or cooked and used as a mouth wash in toothache. The roots are kept in the ear by the Bavarians.

Plum, Prunus. The Roumanians chew a plum which is filled with a small particle of bluestone.

Pomegranate, Punica granatum. The decoction of the

leaves forms a good mouth wash against ulcerated gums and loosened teeth.

Poppy, Papaver somniferum. A decoction of the ripe capsules in milk is used in Russia as a mouth wash to cure toothache. The same method of treatment is met with in Bohemia. Holding a grain of opium between the teeth helps the sufferer from toothache in England.

Privet, Ligustrum vulgare. See under Hop.

Purslane, Portulaca oleracea, was used in ancient Greece and Rome against toothache.

Rest-harrow, Ononis spinosa and Ononis antiquorum, of the Fabaceæ family, cooked with vinegar and used as a mouth wash, is good for toothache.

Rhubarb, Rheum officinale. Decoction of rhubarb helps the Styrians suffering from toothache.

Rose, Rosa. A decoction of the dry leaves in wine helps to cure diseased gums if applied with a feather or used as a mouth wash. Rose leaves are used for fumigation against toothache in Bohemia.

Rosemary, Rosmarinus officinalis. The leaves are chewed in order to expel fetor from the mouth and bad teeth. The Slovenes put rosemary, horse bones and sugar in a pan, hold the pan over a flame, cover their head with a towel and inhale the fumes.

Rye, Secale cereale. Rye flour, wrapped in small linen bags and heated, is tied to the cheek in case of toothache. One will have healthy teeth during the whole year if one sweeps the first three ears, which are found blooming, through the mouth and swallows the filaments which are stripped off thereby.

Sage, Salvia officinalis, is cooked and wrapped in a small bag and applied to the cheek as a cataplasm against toothache. The Czechs rinse their mouths with infusions of sage, the Ukrainians with a saturated infusion of herba salviæ.

Silphium is an apiaceous plant, perhaps the laserwort,

which the Greeks used medicinally. In toothache the juice was administered to the cavity or wrapped in a small linen bag together with incense and used as a cataplasm or added to a decoction of hyssop and figs with vinegar and employed as a mouth wash.

Spruce, Picea. The Roumanians chew the resin of spruce for the relief of toothache.

Spurge, Euphorbia. The milky juice of Euphorbia Characias was instilled into the carious cavity by the Greeks to relieve the pain; but the entrance to the cavity must be closed with wax or the juice might flow out and injure the mucous membrane of the throat and tongue. The root helps, too, if cooked with vinegar and used as a mouth wash. In Bavaria the ailing tooth is rubbed with a dough made of flour and spurge (Euphorbia lathyris), which is supposed to make it fall out easier. In some regions of Russia, if one has toothache, the juice of euphorbia is applied to the ear lobe on the side of the aching tooth; this is repeated every three or four hours. The result is the formation of pustules which spread all over the skin of the part and work as a "derivative."

Squill, Scilla maritima. Vinegar of squill, Acetum squillæ, was used in the diseases of the teeth and gums, chiefly as an astringent.

Stavesacre, Delphinium staphisagria, helps against toothache if cooked with vinegar and used as a mouth wash; it also checks pyorrhea and, in combination with honey, heals inflammation of the oral cavity.

St. John's wort. The root of Hypericum olympicum cures toothache if chewed upon.

Stone-pine, Pinus pinea. The leaves cooked in vinegar furnish a helpful mouth wash against toothache.

Strawberry-tomato. In western Bohemia one takes strawberry-tomatoes, Physalis Alkekengi, and wax and makes a cake of them. This is placed on a hot iron upon which a jar is held; the jar has a hole at the bottom. A

funnel is placed over the hole with its broader end, the narrow end being approached to the aching tooth. Then the worms fall out and the pain disappears.

Sumach. Carrier's sumach, Coriaria myrtifolia, produces a gum which is placed in the carious cavity to check the pain.

Thistle. The decoction of the root of Cnicus ferox served the Greeks as a mouth wash in the case of toothache. A strange toothache remedy is reported from the Magyars: They cut in autumn the dry, thorny fruits of the blessed thistle, Cardus benedictus; usually a worm is found inside which imparts to the one who crushes it with his finger a peculiar "electric power." Due to this power, everybody whose aching tooth he touches with his finger is instantly relieved of his toothache.

Black quotes the following prescription from medieval England: If a worm eats the teeth, take holly rind over a year old and root of carline thistle, boil in hot water, hold in the mouth as hot as thou hottest may.

Thyme, Thymus vulgaris, is used by the Slovaks for the filling of carious cavities.

Tobacco, Nicotiana Tabacum, is emloyed very freely in the popular cure of toothache. It is generally believed that the smoking of cigarettes or cigars or the chewing of tobacco relieves the pain. This opinion is reported from Swabia, Franconia, Upper Bavaria, and other places. The Polish Jews try to rid themselves of toothache by smoking cigarettes in which the tobacco was mixed with poppy seeds. In Styria the people put smoking tobacco on burning whiskey and when the flame goes out, apply the residue to the carious tooth. The Germans in Gottschee chew tobacco against toothache, the Czechs fill the cavity with tobacco. The women of Moravia "kill the tooth worms" by smoking their husbands' pipes for a while. The Slovaks put in the cavity of the aching tooth the residue remaining in the pipe after smoking.

Toothache-grass, a perennial herb, Campulosus aromaticus, of wet pine-barrens in the southern United States, with a culm three to five feet high, bearing a solitary curved one-sided spike, is very pungent in taste, and the root when chewed so affects the salivary glands that it has been regarded as good for toothache.

Toothache-tree, Xanthoxylum americanum, the northern prickly-ash. The Indians chewed its bark for toothache. In the United States Dispensatory, fifteenth edition, we find, on page 1541, the following remark: The bark, used as a masticatory, is a popular remedy for toothache. The German name of the plant is "Zahnwehholz."

Touch-me-not, Impatiens Noli me tangere, is the material of which a sort of dough is made in Brandenburg; with this the aching tooth and the surrounding gums are rubbed, in order to make the tooth fall out easily.

Wake-robin, Arum maculatum, has in Germany besides other names, also that of "Zahnwurz" (toothwort), because it is used in the cure of toothache. There are a few other plants which are named or surnamed toothwort, but this name was given them not because they might be employed in the treatment of toothache, but because the rootstocks are covered with tooth-shaped scales. The leadwort, Plumbago scandens, is occasionally called toothwort in allusion to the use of its caustic roots and leaves in the cure of toothache.

Wheat, Triticum sativum. Wheaten flour and whiskey are applied to the cheeks as a cataplasm in Bavaria, if the toothache is believed to result from a cold.

Wine and vinegar are very popular as solvents for mouth washes and other toothache remedies.

Wormwood. The decoction of Arthemisia absinthium was used by the Greeks against toothache. The Czechs fumigate with wormwood for the same purpose.

CHAPTER XIII

THE RÔLE OF ANIMALS IN THE TREATMENT OF TOOTHACHE

Ass. Ass milk as a mouth wash strengthens the gums and teeth (Ancient Greece). Kissing a donkey is believed to relieve toothache in Wetterau, Germany.

Bear. Bear's gall helps if applied directly to the ailing tooth (Germany).

Beaver. Castor is good for the teeth if pulverized and instilled into the ear on the side of the ailing tooth (Germany).

Bee. The products of bees, honey and wax, are quite frequently employed in the popular treatment of diseased teeth. They are used either alone or as vehicles in combination with other remedies. Honey may be considered as one of the oldest folk-medicines against toothache; it is mentioned as having this property already in the Egyptian papyrus of Ebers where the following prescription is advised:

"Seps-grains ..... Part I
Dough ..... Part I
Honey ..... Part I
Oil ..... Part I.

To be applied as a plaster." During the forty centuries following the composition of this hieroglyphic work, honey has not disappeared from the list of medicaments employed in dental folk-cures. We still find it as a remedy for ulcerated gums among the Swabians.

Wax is chiefly in use to fill carious cavities; hollow teeth are stopped with it in Bavaria, in Styria, in Bohemia, and in Dalmatia. In Styria the wax of the so-called resurrec-

tion candles (*i.e.* the three-armed candles which are carried about during the procession on Saturday before Easter) is preferred for this purpose. In some places the wax of the "Blasius-candles" (*i.e.* those candles between which the priest gives his benediction to the believers on the day of Saint Blasius, February third) is used. Wax taken from altar candles helps those suffering from toothache in Esthonia.

It is noteworthy that the first scientific attempt to fill carious cavities was made by the Arabian physician, Rhazes, with a material composed of ground mastic and honey.

Agnus Dei is a medallion or cake of wax blessed by the Pope, on which a figure of a lamb as an emblem of Christ, often with a cross and banner, is stamped or otherwise impressed. Scrapings of this medallion taken internally with water give instant relief in the case of toothache in Upper Bavaria.

Beetle. In the Palatinate one obtains cure from toothache and at the same time prevents the occurrence of future attacks if one helps a beetle, which is found lying on its back, to reassume its normal position and thus enables it to run.

Bezoar. Bezoar is a concretion found in the stomach and intestines of ruminants and some other animals, often formed by lime or magnesium phosphate or the like about some foreign substance, and sometimes consisting entirely of hair or vegetable fiber. Bezoars are classed as Oriental, that obtained from the wild goat of Persia and various antelopes; Occidental, that obtained from the llamas of Peru; and German, that obtained from the chamois. In Germany the one suffering from toothache was supposed to take in the evening a bezoar powder with water containing slices of lemon. In Bohemia, too, bezoar powder, taken internally, is believed to help in the case of toothache.

Cat. To rid oneself of toothache one chases in Bavaria a cat over ploughed fields—it must be athwart—until it perspires between its legs; the ailing tooth is rubbed with the sweat.

Coral. In the Middle Ages decaying teeth were filled with coral in order to extract them. The same is still done in western Bohemia where red coral is ground and placed in the carious cavity.

Crayfish. In Central Franconia this very cruel remedy is prescribed against toothache: If the ailing tooth is on the right side, the left eye is removed. Then a pipe is stopped partly with tobacco, the eye is put into the tobacco, and the pipe filled. This pipe shall be smoked completely, and the toothache will disappear.

In other parts of Germany, in the eighteenth century, a powder was used, which consisted of a mixture of crayfish's eyes, saltpeter and sugar soaked with lemon juice; this powder was to be taken several times during the day.

Crow. Cavities were filled with crow's dung. It "breaks the tooth and removes the pain."

Deer. Of deer's horn Dioscorides says: "Deer's horn, finely pulverized, makes the teeth smooth. Fumigation with raw horn expels the pain. Cooked with vinegar it relieves as a mouth wash the pain from the cutting of the molars." Deer's horn burnt until it whitens and dries was a popular remedy against toothache in the Middle Ages. If burnt to powder, wrapped in a bag, and applied to loosened teeth, it strengthens them and removes the pain in the Tyrol and Austria.

Dog. A powder made of dog's teeth was supposed to help against toothache in former centuries. It is still in use among the Ruthenians.

If one throws the left upper canine tooth of a dog into the fire, toothache will disappear as soon as the fumes thereof are dissipated.

According to Pliny, toothache disappears if you burn the

heads of such dogs which die of hydrophobia after freeing them from the adherent flesh, mix the ashes with oil, and place the whole in the ear on the side of the aching tooth.

Dogfish. The brain boiled in oil or steeped in water and vinegar relieves the pain if used as a mouth wash.

Earthworm. The "entrails of the earth," cooked with oil and instilled into the ear of the opposite side, removed toothache in ancient Greece. Pliny recommended a decoction of earthworms in oil, instilled into the ear on the side of the ailing tooth. (*Vermes terreni decocti in oleo et triti infunduntur auriculæ ab ea parte qua dentes dolent.*) Kräutermann gives this prescription against toothache:

"Gather a number of earthworms and put them in a dish filled with moist sand. Strew over it the minced yolk of one egg. The earthworms shall eat it. After some time they are cleaned, put in a pot, which should be covered well, placed in a bake-oven, and dried. About two egg-shells full of this powder are rubbed to form a salve together with bloodstone and red sandal, two ounces each, unadulterated musk, two scruples, lard obtained from a he-bear, lard from a boar, five ounces each, pulverized masterwort, dried frog's spawn powdered, one ounce each. This mixture is kept in a place where no woman should be permitted to stay during the time of her menstruation. If you wish to use it, you should first scratch the tooth with a splinter of aspen-wood and then smear the salve upon it.

Eel. The New Zealanders have the following rhymed prescription against toothache:

An eel, a spiny back,
True indeed, indeed,
True in sooth, in sooth,
You must eat the head
Of said spiny back.

Fox. A very peculiar advice against toothache, which does not lack a certain sense of humor, is reported by Kümmel from Gadow, Province of Brandenburg: If your

teeth bother you, just run three times around the church without thinking of a fox.

Frog. In Greece frogs cooked with water and vinegar furnished a mouth wash which was helpful in toothache. In western Bohemia the pain is relieved if a live frog is applied to the cheek or to the head on the side of the ailing tooth. The Ukrainians administer frog's legs to the cheek. In Ireland the head of a frog is pressed upon the aching tooth, an act which is accompanied by the utterance of the three names of the Trinity. Marcellus, of old, to cure toothache, recommended the patient to spit in a frog's mouth, and request him to make off with the toothache, and in Cheshire, England, it is still by no means uncommon for a young frog to be held for a few moments with its head inside the mouth of a sufferer from aphtha or thrush.

In Germany, to make a tooth fall out without pain, one takes two or three tree frogs, seethes them in water, takes off the fat swimming on the surface, and applies it to the tooth.

Gallfly. Bedegar, an excrescence formed on the sweetbriar and other roses by various gall-flies, especially Rhodites rosæ, was used in Germany as a popular toothache remedy. The patient took it in his mouth and held his face over hot water. When the small maggots of the gallflies fell out of the bedegar pieces and were dropped into the water, the people thought that the "toothworms" had fallen out from the diseased tooth. The Slovaks press the aching tooth between thumb and index finger after crushing the larvæ of gallflies with those fingers.

Glowworm. "Make up a powder of dried glowworm, add leaven the size of a hazelnut, mix both, make a plaster, put it on the ear lobe, leave it there for two or three days, it makes a blister; lance this and treat it like any other blister." (German prescription against toothache.)

Goat. Certain diseases of the mouth, particularly inflammation of the gums, were treated with a mixture of goat's

dung and goose-dripping. Pliny recommended goat's milk for a mouth wash against toothache.

Goose. See under Goat.

Hare. In Swabia the gums are rubbed with wine in which the brain of a hare was cooked.

Hen. The Romans touched the aching tooth with a hollow chicken bone which had been kept in the wall for some time without being allowed to decay; the bone must be thrown away after it had been used.

In Bavaria a hen's egg is opened, the white cuticle surrounding the yolk is removed, wrapped around the little finger of either hand of the patient suffering from toothache, and left there until it dries; the pain disappears promptly.

Hog. In Swabia the petrosal bone of a hog, which is believed to have the shape of a skull, is cut off and worn around the neck against toothache. In Salzburg, Austria, the heel bones of a hog were worn for the same purpose. Another prescription reads thus: Take a piece of the stomach of a newly butchered pig, wrap it in a rag and apply it to the gums for thirty minutes.

Horse. In Prussia (Seebeck) the scrapings of a horse's bone are smoked with tobacco as a remedy against toothache. The Slovanians inhale the fumes of a mixture of rosemary, horse's bone, and sugar, placed on the fire in a pan.

Hyena. The teeth of the hyena, if strung into a chain or even touched, are said to help against toothache.

Ladybug, Coccinella septempunctata, plays an important rôle in the popular cure of toothache. If touched, this beetle excretes a yellow juice having a strongly opium-like odor which during the Middle Ages was employed against toothache almost everywhere in Europe. It is, according to Stern, still in use in Turkey. In Brunswick the bug is crushed and then applied to the aching tooth. Hovorka and Kronfeld quote a Bohemian prescription dating from

the year 1560: Crush a ladybug and apply the fluid remaining on the fingers to the hollow tooth, whereupon the pain will disappear at once. For the use in wintertime, collect half a bottle of these bugs, fill it with alcohol, cork it up well and let it distill in the sun for a few days; the extract is preserved and, in the case of toothache, applied to the tooth with the finger or on a piece of cloth. The use of Coccinella against toothache is also known to the Bavarians.

Lion. If the canine tooth of a lion is suspended about a boy's neck before he loses his first teeth, he will be free from toothache when his second teeth come.

Lizard. To make a diseased tooth fall out without pain take a wild lizard, cut and pulverize it, clean the place around the tooth, and cover it with the powder, whereupon the tooth may easily be removed with the fingers without the aid of an instrument.

In Bohemia a living lizard is administered to the head or cheek on the side of the ailing tooth. A piece of the animal's liver, placed in the cavity, removes the pain.

Louse. In Styria, in Swabia, in Bohemia, in the Tyrol and in other regions of Central Europe a hole is drilled in a dried bean, in this hole a living louse is placed; the hole is closed with wax, and the bean suspended about the neck. In Swabia the louse is also placed in the hollow tooth of a skull. In some places it is even deposited in the cavity of the aching tooth. In the Province of Brandenburg, there exists the following prescription:

> Take a bean and make a hole,
> Catch a fat louse and put it in,
> And when the louse has died therein,
> The toothache will be licked away.

Mole. The Romans used to rid themselves of toothache by tearing out a mole's tooth and carrying it with them, tied to the body.

In Russia it is considered a remedy against toothache to

throttle a mole with two fingers or to stab him and then to besmear both hands with the blood; the hands should not be washed for twenty-four hours. The paw is worn in Upper Austria as an amulet against toothache. In Wiltshire, England, the laborer wears the forelegs of a mole, and one of its hind legs, in a bag to secure his immunity from toothache. A paw cut from a live mole is thought in Sussex to be good for toothache. Take a living mole, break one of its teeth out and let it free again, and hang the tooth around your neck. Bite off the right paw of a mole, and you will never have toothache.

Mouse. To be cured from toothache, bite off the head of a living mouse and suspend it from the neck, but beware of making a knot in the thread or in the ribbon upon which it is suspended. One always has good teeth after eating from the bread which was gnawed by a mouse, and particularly the very place which shows the notches from the animal's teeth.

Neat. If the gums are swollen, beg of a butcher a small piece of fresh beef, rub it against the aching place and have a black dog eat it. The Silesians, to protect themselves against toothache, are told to steal a piece of beef, to wrap it in a new linen rag and to bury it under the eaves of the house.

Ounce. The Cholones of eastern Peru think that to rub the cheek with the tooth of an ounce is an infallible remedy for toothache and face-ache.

Owl. If you pick your teeth with the nail of the middle toe of an owl, you will never have toothache.

Partridge. In former centuries cavities were filled with the brain of a partridge.

Pigeon. In some places in Germany ring-doves are kept in the house, owing to the belief that they attract toothache.

Plant-louse. As a remedy for toothache the ear was rubbed with a mixture of rose oil and plant-lice.

Raven. Raven's dung applied to the tooth on cotton or placed in the cavity takes the pain. It will also make teeth grow again where they have been lost.

Roe. Its gall, instilled into the ears with warm rose oil or garlic juice, relieves toothache.

Salamander. The Wendish inhabitants of the Spreewald rid themselves of toothache by biting off the head of a salamander and spitting it out again soon. To make a tooth fall out without pain, the peasants in England catch a few salamanders and those small bugs which are found in summer in the fern plants, burn them in an iron pot and make a powder of them; then they moisten the index finger of the right hand, cover it with the powder and rub with this the tooth several times, but should not spit it out; the tooth will fall out very easily.

Salmon. Saint Hildegard of Bingen (1098-1179) recommended pulverized salmon bones against bad teeth.

Sargon. Its teeth make immune against toothache.

Snake. Serpents' skin, steeped in wine, was thought a good toothache remedy by Dioscorides. The Romans, according to Pliny, inserted a piece of a snake's skin in the carious cavity to make the pain stop. The Slovanians become immune against toothache if they dress a stick in spring time with a snake so that the skin just fits the stick. Both stick and skin are allowed to dry and the whole is pulverized and smoked in a pipe like tobacco. The Ruthenians strew the powder of a ground snake's tooth on the ailing tooth.

The Tuscarora Indians of North Carolina used to catch a snake which they held in both hands, biting off small pieces of the center; if this was done the teeth were supposed to be immune against toothache. Snakes' hearts are also prescribed.

Spanish Flies, Cantharides. In Bohemia theriac, five Spanish flies and three onion peels are mixed to form a pap which is applied to the elbow of the arm on the side of

the ailing tooth, or Cantharides are administered to both legs.

Sparrow. Sparrow's dung warmed in oil and placed in the ear on the side of the ailing tooth takes the pain, "but it tickles you very much."

Spiders are in use against toothache, according to Hovorka and Kronfeld. Mix eggshells, spiders and oil together and boil this until it is reduced to one-third its volume, then keep it in your mouth.

Sting-ray, Trygon Pastinaca Cuv. The prick which grows from the tail and looks toward the scales prevents toothache; for it "crushes the teeth and throws them out."

Stork. In Saxony the one who greets the arriving stork remains free from toothache. Similarly, in other parts of Germany the one who first notices the arrival of the stork and welcomes him will not suffer from toothache for the rest of the year.

Thornback. To get rid of toothache and to make the tooth fall out without pain, scratch the gums with the prick of a thornback or pulverize the prick and glue it to the tooth with wax.

Toad. The Czechs hang a living "mangy" toad on one leg in the chimney and allow the animal to dry; if one of the family suffers from toothache, he uses a small piece for fumigation. Or the teeth are rubbed with the leg of a toad freed from the flesh.

Urchin. The Slovaks catch an urchin on St. George's day and skin it; in the case of toothache the dried skin is pulverized together with dried rose leaves and fumigated with on glowing coal.

Vulture. Take the eyes and the beak of a vulture, burn them to form a powder, put this in warm water, and keep it in the mouth or rub the teeth with it, and you will have immediate relief.

Weasel. Its head is an amulet against toothache in Bavaria.

CHAPTER XIV

TOOTHACHE TREATED WITH HUMAN ORGANS AND SECRETIONS

Blood. In Brandenburg the gums are rubbed with human blood, which then is deposited in an ant hill.

Bones. If you suffer severely from toothache, you are told in Bavaria to go at midnight, or at least before sunrise, without being spoken to, silently to the churchyard and to bite the bone of a skeleton. Martius recommended that the bone of the right thigh be used to rub the aching tooth; the pain would cease.

Ear-wax. In Bohemia small pills are made of ear-wax, which are placed in the hollow tooth to relieve the pain. This certainly is the strangest of all popular "filling materials."

Fat. In medieval Silesia the aching tooth was rubbed with human fat.

Hand. Performing cures by laying the healer's hand on the sick is a very old, widespread, and well-known folkloristic remedy. To the kings of England the people ascribed the gift of healing by means of this method. In the popular toothache therapy the hand plays an equally important part. This form of treatment was apparently used by the ancient Hebrews, for there is a legend told by the Talmud that the Patriarch, Rabbi Jehudah, once was tormented with toothache and that the prophet Eli appeared to him and cured him by laying his fingers on the diseased tooth.

In Swabia, to free an individual from his pain, rub the patient's hand with your own hand until it becomes very warm, then stroke with it the patient's cheek three times, and he will lose his pain. In Prussia one presses with the

finger hard against the ear of the aching side, which will make the sufferer feel better. In Bohemia the right ring finger should be put into the patient's left ear. If you wish to keep the toothache away permanently, you should every morning, immediately after getting up, wash with cold water the left ear with the right ring finger, the right ear with the left ring finger, the teeth on the left with the right ring finger, and the teeth on the right with the left ring finger.

All over Europe, particularly in the central countries of the continent, touching the aching tooth with the hand of a corpse is a powerful magic granting immediate relief. In Prussia the index finger of the right hand is believed to have a greater healing power than the other fingers. The most infallible remedy consists in pressing the finger of a corpse three times against the aching tooth; this is accompanied by the following words:

"To thee, the deceased,
I complain of my pain.
Take my toothache from me
And keep it in thy grave.
In the name, etc."

Lips. In Spain it is considered an infallible safeguard against toothache to kiss the lips of an infant not yet baptized before its lips have come in touch with anyone else.

Milk. A Prussian proverb says: Mother's milk and Christ's blood are good for the toothache.

Saliva. In Germany and in Bohemia it helps if you moisten your thumb with saliva and rub with it gently the arm of the ailing side from the wrist upward until the middle of the forearm, following the veins.

Teeth. An especial healing power is attributed to the teeth of the dead, and in particular where it deals with the relief of toothache. Touching the aching tooth with one of a dead man was an efficient remedy all during the Middle Ages and later. The tooth of a man killed in war, or exe-

cuted as a criminal, or even accidentally killed, is said in Mecklenburg and in Silesia to possess the virtue of relieving toothache if passed over the aching tooth or the aching side of the face. In Swabia there is, according to Birlinger, a prescription which if adhered to in all details is very potent for the relief of toothache. One must go at exactly midnight to the cemetery or to the bone house and there break a tooth from a human skull and with this rub the aching tooth. A variation of this same prescription is to take the tooth from a skull, then take a dried bean, carefully drill a hole in the bean and in this hole place a living louse; close the hole with wax and then carry the tooth with the bean wrapped in a piece of cloth about the neck.

Urine. If nothing else helps, the Swabians obtain relief from rinsing the mouth with their own urine.

CHAPTER XV

INORGANIC TOOTHACHE REMEDIES

Agate. An agate is worn by the Swabians as safeguard against toothache.

Alum has a good effect on ulcerated gums and makes loose teeth firm if mixed with vinegar and honey and applied directly to the diseased place.

Arsenic. The Chinese used to make arsenic into pills which were placed near the aching tooth or into the ear of the opposite side from the aching organ, whereupon the pain would positively cease.

Carnelian, a red variety of chalcedony, according to Aristotle, is a good remedy against hemorrhage and ulceration of the gums. Ibn al-Beithar mentions that it strengthens loose teeth.

Gold. The unknown author of "Zahnarzneybüchlein," printed by Michael Blum in 1530, credits Mesuë, surgeon to Caliph Harun-al-Rashid (786-809), with the use of gold foil as a filling material. This, however, has not been reliably established.

Hydrochloric acid. In Bavaria a drop of hydrochloric acid is brought into the hollow tooth by means of a brass wire.

Iron. In certain parts of Germany toothache is relieved by inhaling fumes which were produced by the pouring of oil on red-hot iron.

Iron rust is believed to strengthen the gums and to make loose teeth firm.

Iron sulfate. The peasants of British East India make up a paste of iron sulfate, gallnuts and water, with which they cover the aching tooth.

Lead. The Styrians rid themselves of toothache by keep-

ing under the tongue a used lead bullet which has passed through a game. The Russians take a teaspoonful of finely granulated gunpowder, wrap it with a thread in a small piece of fine cambric and form thus a little ball which is kept in the mouth and chewed upon slowly; very soon the salivation becomes abundant, and the saliva must be spit out quite often. After a few minutes of chewing the pain will be lessened, and after about a quarter of an hour disappear entirely. The Slovaks fill their hollow teeth with gunpowder, so do also the Magyars.

Nitric acid. One or two drops of nitric acid are used occasionally in Europe and in America "to kill the nerve." This is particularly common among the Slovaks and the Styrians.

Salt. The Talmud is in favor of applying a grain of salt to the aching tooth. In ancient Greece salt was considered helpful in the cure of ulcerated gums. Celsus recommended rock salt for the same purpose; similarly Pliny thought it to be a good toothache remedy. To-day salt is still employed quite frequently in the cure of diseased teeth. It is usually heated, wrapped in a small bag and applied to the cheek. Salt is also a very common ingredient of mouth washes used for the relief of toothache. Rinsing the mouth with a salt solution is believed to be very efficient everywhere. In Sweden salt is covered with whiskey in a cup, which is placed on glowing coal; the fumes thus produced are inhaled in the case of toothache. A similar cure is reported from Bavaria.

Saltpeter is in Europe a very common ingredient of mouth washes made up for the cure of toothache. The Slovaks wrap a piece of niter in a rag and carry it under the arm; as soon as the niter fades away, the toothache will be gone.

Verdigris, the green rust on copper. All sorts of verdigris were considered by the ancient Greeks and Romans helpful in ulcerations and inflammations of the gums.

Sory, a mineral product of the copper mines, containing iron sulfate, cures toothache if placed in the decaying cavity, and renders loose teeth firm.

Water. A warm foot bath is appreciated in very many countries inhabited by the White Race as very good for toothache because of its diaphoretic effect. Moist and warm applications to the cheek are known everywhere. The Czechs inhale steam after putting a hot pebble into the water in order to maintain a high temperature for a longer while. The Slovenes use a piece of hot iron in place of the pebble. There is a humorous advice given to those suffering from toothache which I overheard in various places: To get rid of the pain take a mouthful of cold water and sit on a hot stove until the water in your mouth begins to boil. You won't feel any pain in your tooth by that time.

CHAPTER XVI

THE WRITTEN AND SPOKEN CHARMS AGAINST TOOTHACHE

In the folkloristic cure of diseases a most important place is occupied by the spoken word, in the form of adjurations, incantations and exorcisms, or fixed on a piece of paper, on stone or on wood. It is a powerful agent, at least as effective as herbs or the methods of manual therapy. "In the beginning was the Word," begins the gospel of Saint John; the word of God has created the world. The wisdom of our ancestors was handed down to us in many phrases, proverbs and similes, unchangeable groups of words which even Charles Dickens' "unhallowed hands would not disturb, or the country would be done for."

The great power acquired by the priests and bards through their knowledge of the hieroglyphic or cuneiform or runic characters, the suggestive properties of the word that led to hypnotism, supported the belief that there is a great magic charm in the spoken and in the written word. A prayer should not be altered, for any change in the succession of its words would make it less, or not at all, efficient. Martin Luther, who introduced the German, instead of the Latin, language into the church service, was considered by his adversaries a tool of the devil. To the analphabetic people in former times, those few who had learned how to read appeared to have supernatural, either divine, or devilish, abilities.

I remember how strangely touched I was when one day in the latter part of the World War, walking through the streets of Przemyśl, Galicia, with a newspaper in my hands,

an old Polish peasant woman addressed me thus: "Dear sir, please read in the paper that the war is going to be over soon." She thought that the one who had the knowledge of reading could read in the paper whatever he wanted.

Charms as methods of healing are very old. They were known to the ancient Egyptians, Babylonians and Assyrians. The Bible warns against them as being ungodly (Leviticus 20, 27; Deuteronomy 18, 10). Pliny says that in most diseases one should think first whether there exist any words or charms against them. And in the Middle Ages they formed a part of "scientific" medicine.

Toothache is, as a matter of course, not exempt from the ailments curable by spoken or written charms. As late as 1914, the "Berliner Tageblatt" reported a lady who, suffering from frequent pain in her teeth, consulted a "sorceress" and was ordered to take a foot bath before sunrise and then to pour the water out after sunset. She received, in addition, a slip of paper containing the words: "When the evening glow decreases, toothache ceases." The lady in question was not by any means a member of the lowest class of the population, where lack of education and an uncultured environment might justify the superstitious trend.

Not so very long ago, a joke was played in Wurttemberg on a man of high social standing, who was vexed by a severe toothache. He was given a scrap on which a few words were written. He put it in his pocket, and at once the pain disappeared. He told this to his friends. When somebody asked him whether he had read the scrap he took it out of his pocket and read: "Thou shalt see me in Hell," evidently a parody of the famous phrase: "Thou shalt see me at Philippi." Disgusted, he tore the slip, and the toothache reappeared.

Similarly, a young woman in Chelsea had a sealed paper to guard her against toothache. Her priest prevailed on her to open it, and all inside was found to be:

"Good Devil, cure her,
And take her for your pains."

Black, in his "Folk-Medicine," demonstrates very clearly the belief in charms with this story: "A lady had tried all remedies for incessant toothache, but in vain. One of her shepherds, touched by her sufferings, asked for leave of absence, and hurried to a brother shepherd, a south-countryman, living in a glen some twenty miles off, whom he knew to have had at one time a marvelous charm in his possession. It was lent on the security of the northern shepherd's watch, and in less than half an hour after it had been hung round the lady's neck her toothache vanished forever. The charm, which was similar to those given above, was written on what seemed like an old fly-leaf, and was encased in a piece of green silk, sewn into the form of a Maltese cross. On inquiry it was found that the charm had been introduced into the glen in the early part of this century by an Irish packman, called Ambrose Keen. All the people about the place firmly believe that Mrs. —— was cured by the virtue inherent in this charm. As for herself, although she will not actually confess that she believed with the rest, she seems very plainly to show that she has some hidden faith in it; for it vexes her when any one laughs at what is a piece of superstitious nonsense."

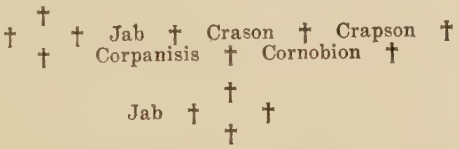
In Newfoundland a letter "written by God to Abzarus, King of Edessa, and fallen down from Heaven" is worn next to the bare skin against toothache.

The simplest and most imperative form of charm is that employed in Brunswick. There the people write on the outside of their door: "Toothache, stay away, I am not at home." Similarly, one says in Prussia: "I calm every lot in life and also the toothache."

This is relatively clear. But we do not know the meaning of the inscriptions on so many "toothache slips" which are probably the mutilated remnants of more than a thousand-year-old heathen phrases. In the Palatinate, for

instance, a slip on which the apparently senseless words: "Anosim sinobia zenni tantus leckt veri," are written, is an infallible remedy against toothache. In Bavaria the same formula is found, but spelled a little differently: "Onosum sinobai Zenni tantus leet (or luet)." This scrap is suspended over the back with a thread.

In Switzerland the following charm is used:



Swiss Toothache Charm.

Fossel reproduces in his book a "toothache slip" from Gröbming in Styria. It contains the characters: L, A, C, S, O, N, J, N, S, written in three rows. The helper mutters first some mystic words, and then pierces, in the presence of the patient, with that fork which the sufferer uses at the table, one character after the other in their given order, pronouncing each time the patient's name. Then the slip is burnt, and the patient must rest, for immediately after the burning the toothache first becomes severer, but after a short time leaves forever.

In western Bohemia the slip is tied about the neck with a red silk thread. If the patient takes it off after nine days and throws it into running water he gets rid of the toothache for the rest of his life. The words on the slip read thus:

Bohemian Toothache Charm.

Saint Anna, who evidently is referred to in this formula, also figures in another incantation recorded from Brandenburg:

There were three saint women;
The first was Anna,
The second Susanna,
The third was Sibyl,
Toothache, keep still.

The number three, which we meet here for the first time (three saint women), is unusually common in the toothache charms. In another group, the adjuration of the moon plays a predominant rôle. Very often, however, both the holy three and the moon are combined in the same verse.

The value of the number three is demonstrated in the following charms:

Three virgins went to the holy hill:
They sought for the herb and they found it,
The toothache is gone. † † †
(From the Wends in the Lausitz.)

Three lilies grew on Jesus' grave,
The first was called Cheerful,
The second Jesus' Blood,
The third God's Will.
I tell thee, pain, keep still.
Thou shalt not effervesce,
Thou shalt not ulcerate,
Thou shalt not ache at all,
I tell thee, pain, keep still.
(From Brandenburg; the aching cheek shall be blown upon three times.)

"The Lord Jesus warns the tooth-ragers, there were worms, three white, three black, three red; he took the other two and killed those with these. This I tell thee for atonement. † † †"
(From Bavaria.)

Black, white, and red—these three colors mentioned in the preceding charm—are also met with in other variants reported from the Tyrol and Bohemia. One of them runs

thus: "My teeth ache, a black one, a white one, a red one. I wish they all bleed to death. In the name † † †"

In a number of formulæ we find some change in the arrangement or in the selection of the colors, as gray, black and red, or black, blue and white, or white, blue and red, etc.

Very many toothache charms are devoted to the moon. Some of them show a close, almost literal resemblance to each other, so that we may confine ourselves to the recital of one or two paradigms of each type.

My dear moon, I complain to thee,
Toothache and bad demons torture me,
Take from me,
Take to thee.
In the name of † † †
(Brandenburg.)

Light moon, green leaf,
Roots in the earth
(here the tooth is seized),
Make the toothache deaf.
Thou shalt cheat
And not heat.
(Brandenburg.)

Little moon, decrease,
Go away from us.
Little worm, go away,
And do me no more harm.
(Bohemia; the waning moon is addressed.)

I greet thee, thou bright light,
For the teeth and for the gout,
For the red little worms
That are in my teeth.
(Baden.)

O thou dear new light,
Save me, my Lord, from the gout in my teeth.
That they shall not
Irritate, straddle, torment, effervesce.
(Goldap, Prussia.)

"Young moon," says the one affected with toothache in the Russian republic of Taurida, "on thee the golden cross! The son asks his father, 'Have the dead toothache?'—'No,' they have not.'—Thus the baptized born servant of the Lord, X., may have no more toothache." Whispering this, one has to look at the moon.

The combination of the moon with the number three is seen in the following charms. It is very common in Brandenburg, in Ukrainia and in Bohemia.

A formula used in Brandenburg runs thus:

> Moon, I see thee with two edges,
> Thou shalt not heat,
> Thou shalt not eat,
> Not ache until I see thee again with three edges.

Here is another charm from Brandenburg:

> I greet thee, thou new light
> For the pains and for the gout,
> For the three little worms
> That are in my teeth.
> The one is gray, the other blue, the third red,
> I wish they were all three dead.
> In the name, etc.

This is obviously a combination of two of the various formulæ cited above and of four different principles: the moon, the worms, the number three and the three colors. In Alt-Ruppin, Mark Brandenburg, the people say:

> I see thee, thou bright light,
> Three kinds of meat I do not eat,
> Of the cat, of the rat, of the dog,
> O Lord, take the pain from my mouth.

In Ukrainia one goes on the night of a new moon in front of the house and repeats three times: "Moon, Prince! There are three of your kind in the world, one in the sky, the second on earth, the third in the sea, the white rock. As they all cannot come together, so I, the servant of God,

X., cannot have toothache." Then follows the Lord's Prayer and Ave Maria. Finally one says: "Thou shalt have the golden crown and myself luck and good health." This formula is repeated each month. When one sees the new moon for the first time in the month, one turns so that the moon is on the right side and says: "The moon in the sky, the dead in the grave, the rock in the sea: if the three brothers come together and have a banquet, then my teeth will ache again."

This Bohemian charm is directed to the new moon:

> The moon is new,
> And God is good,
> May my teeth not ache
> Until the moon will have three horns again.
> Moon, I see thee with two edges,
> I pray thee that my teeth do not ache
> Until I see thee with three edges.
> This be in the name of † † †
> (Western Bohemia; the charm is followed by three, five, seven, or any odd number of paternosters.)

There are several charms against toothache, which are spoken only in connection with the "nailing" of the pain and with the tree cult, and are therefore quoted in a special chapter dealing with this method of curing toothache. In this place we wish to add a few formulæ in which either the Lord or the aching tooth itself is addressed.

In the German part of Bohemia one places the index finger of the right hand upon the aching tooth and says: "I take the pain as God the Father has taken it from his Son on the cross, in the name † † †. I loosen the nerves as God's Son was loosened from the cross, in the name † † †. Tobia reko. Amen." (To bi ja reko means, This I would say.)

Lammert cites an old charm from the middle of the sixteenth century, which also implores the Lord. It was used in Eichstatt, Bavaria. "O du almechtiger, barmsher-

ziger gott, man wandelt dein rosaffarbes blut, das sei mir N. vor mein zan we gutt, das zel ich mir N. zu bus, im namen des vatters vnd des suns, vnd des heiligen geist, amen. Vnd ir must das gereden, eur lebelanck, so offt ir einer mes seit, vnd secht den kelch auff heben, so wolt ir disse wort sprechen. Es hilfft gewisslich." (O, thou almighty merciful God, they changed Thy rose-colored blood, this be good for my, X.'s, toothache, this I take for my, X.'s, penitence, in the name of the Father, the Son, and the Holy Ghost. Amen. And you must say this, through all your life; whenever you attend a mass and see the cup raised you shall speak these words. It certainly helps.)

God, again, is invoked in the following charm spoken in Hesse:

God is the hour,
God is the toothache in my mouth,
It is God who has made the day,
The sun, the moon, and the night.
He may take the toothache from thee, X.

In western Flanders, Jesus Christ is called to relieve the pain. One has, at first sight of the new moon, to make a cross and to say this:

A thorn from my hands,
A worm from my teeth,
I leave my soul in Jesus' hands.

In Hungary, according to Wlislocki, the one who suffers from severe toothache goes on a mountain or sits down on a rock after having formed a circle of birthwort plants (farkas-gégevirág, Wolfskehlenblumen, Aristolochia clematitis) around the place. Then he has to chew each of the blossoms and to spit them out. The flowers forming the circle must be thirty-two in number because "Christ was thirty-two years old." After having chewed all the blossoms, the patient says: "Christ was thirty-two years old when He died; I have thirty-two teeth and have gnawed

thirty-two flowers; mountain, take the pain from them and make them as strong as thou art."

According to a Mohammedan tradition, Mohammed advised the following infallible method of curing toothache: The person suffering from it shall place his finger upon the aching tooth and speak verse ninety-eight of the sixth sura, which runs thus: "And it is He who made you descend from a man; and He gave you a stead and a resting-place in the mother's womb. In a clear way we have now interpreted the signs for intelligent people."

The tooth itself is invoked in these charms:

Tooth, thou rough master with thy white bones,
If thou wilt break,
I do adjure thee
That thou shalt go to thy place.

Thou shalt not ache,
Thou shalt not tingle,
Thou shalt not swell,
Thou shalt not tear,
Thou shalt not splinter,
Thou shalt not ache,
In the name . . .
(Manuscript from Swinenmünde.)

In a few charms, running water is supposed to carry the pain away. A formula from Zielenzig, Baden, asks the river to sink the toothache in the depths of the sea:

Roaring water, I come to thee,
The tearing of my teeth I bring to thee,
It tore me miser day and night,
It may tear thee unto the depths of the sea.

"To-day I come and bid this river, a worm, and the bad blood, a black one, a white one, a red one. There comes the Blessed Virgin and kills them all three in the name of God the Father, God the Son, and God the Holy Ghost." (Amen is omitted.) This formula must be spoken three times before sunrise, the patient must be alone, he must

shovel the water with his hand in the direction of the stream and keep his mouth open. When he arrives at the words, "In the name of God," etc., he takes a handful of water in his mouth and rinses it with the water. This is repeated at the mention of each of the Trinity, nine times altogether. (Mark Brandenburg.)

In the Palatinate the patient goes under a bridge, puts his hand in the water, takes some in his mouth, and says, "I drink water for seeds, my toothache shall leave me, as the stars stand in the sky † † †."

Some people try to transfer their toothache to the deceased by touching the aching tooth with the finger of a dead body three times and saying: "To the dead I complain of my trouble, take my toothache from me and take it with thee to thy grave. In the name † † †. Amen." (Eastern Prussia.)

The Magyars, in the case of toothache, address a sprig of sage (Salvia officinalis), and say: "Sage, sage, then my tooth may ache if thine aches." The patient has, saying this, to smell the sage.

Before leaving the subject, we may be allowed to mention a few more charms against toothache which do not fit into any of the preceding groups, but which are so common that their omission would leave the compilation incomplete. One is a cure against the "tooth-rose."

> A virgin came from Engelland,
> She had a rose in her hand,
> Until the sun went away,
> The seventy-seven fold tooth-rose was gone.

The custom of blowing one or three times at the aching cheek, which we have met in connection with the charm of the three lilies, is also combined with the following two formulæ, the first of which is rather obscure in its meaning and, therefore, not translatable. We give it in the German original form. A crow's foot and a "honey leaf" are mentioned in it.

Oete, boete,
kraehenfoete,
honigblatt,
god is dat.

The second formula is recorded by Kümmel:

All bells ring,
All saints sing,
All epistles are read,
All evil is dead.

In Transylvania the people bite in the cord of a church bell during the chime, and say:

The free mass is sung,
The bells are rung,
The epistles were read,
The worm in my tooth shall be dead.

There is a large group of charms employed in the case of toothache which we would like to call "epical" or "narrative" charms. They usually tell the story of a saint or some Biblical person who was suffering from toothache and consoled or cured by the Lord, and are followed by a prayer or by a magic consecrating act. They originated very early in the Middle Ages and have been preserved to our day through tradition from mouth to mouth and through a number of manuscripts, the study of which gives us the surprising knowledge that the charms contained in them are, word by word, the same as those used to-day in Germany, England and France.

Saint Peter is usually the hero of the story. He either stands or sits under a tree or on a stone and looks very sad or weeps or holds his cheek in his hands. Then Jesus Christ passes by and asks him why he is so sad. Peter answers that his teeth ache. Whereupon Jesus tells him to believe in Him and to go to the river (or lake or pond) and to take some water in his mouth and to spit it out again into the river, and his pain will be gone. Or Peter says that

he has worms in his teeth, and Jesus gives him His benediction and orders the worms to leave his mouth.

Of the many various forms of charms, only few can be recited. The quotation of all would be quite tiresome because of their close resemblance to each other.

Fol. 93a of the manuscript Vesp. D. 20 of the British Museum in London, dating from the end of the eleventh, or from the beginning of the twelfth century, contains the following charms in Latin language:

"Ad dentium dolorem. Petrus sedebat super petram et manus suas tenebat ad maxillas suas et dixit Jesus Christus: Petre quid tristis sedes? Domine vermes . . . (there follows an erasion) . . . in me. Fac mihi benedictionem, quam fecisti Lazaro quem resuscitasti de monumento in nomine patris et filii et spiritus sancti. Amen.

"Adjuro te migranum per patrem et filium et spiritum sanctum, ut tu amplius ne possis stare nec in faucibus nec in dentibus nec in capite tuo. In nomine patris et filii et spiritus sancti. Amen."

This is followed by a regular prescription: "Accipe saxifriga id: grumin et petrosino et ambrosiana et apia et tanesia et mitte simul et decoquas cum vino ut ad medietatem perveniat et postea da infirmum bibere."

A cure charm from Devonshire, England, runs thus: "All glory! All glory be to the Father, and to the Son, and to the Holy Ghost. As our Lord and Saviour Jesus Christ was walking in the garden of Gethsemane, He saw Peter weeping. He called him unto Him, and said: 'Peter, why weepest thou?' Peter answered and said: 'Lord, I am grievously tormented with pain, the pain of my tooth.' Our Lord answered and said: 'If thou wilt believe in Me, and My words abide with thee, thou shalt never feel any more pain in thy tooth.' Peter said: 'Lord, I believe; help thou my unbelief.' In the Name, † † †. God grant ease from pain in the teeth."

There is, according to Clodd, a popular belief that this charm is contained in the Bible. W. G. Black, in his "Folk-Medicine," tells the story of a clergyman who said to one of his sick parishioners when she recited the charm: "Well, but dame, I know my Bible and I don't find any such verse in it." The reply was: "Yes, your Reverence, that is just the charm. It's in the Bible, and you can't find it."

Another charm, stitched inside their clothing and worn by the Lancashire peasants, reads as follows: "Ass Sant Petter sat at the geats of Jerusalem our Blessed Lord and Sevour Jesus Christ Pased by and Sead, "What Eleth thee?' Hee sead, "Lord, my teeth ecketh.' He sead, 'Arise and follow mee and they teeth shall never Eake Eney Mour. Fiat-Fiat-Fiat'."

A similar variant comes from the Island of Mull. "In the Name of the Lord God. Peter sat on a marble stone, weeping. Christ came by and asked, 'What aileth thee, Peter?' Peter said, 'O Lord, my teeth doth itchie.' Christ said, 'Arise, Peter, and be whole and not only thou but all them that carries these lines for My Name's sake shall never have toothache'."

On the Orkney Islands a piece of paper is carried, which has this inscription: "Peter sat on a marble stone, weeping. Christ came past and said, 'what aileth thee, Peter?' 'O, my Lord, my God, my tooth doth ache.' 'Arise, O Peter! go thy way; thy tooth shall ache no more'."

In Newfoundland the people wear a sealed letter on their necks, which contains the following verse:

"I've seed it written, a feller was sitten
On marvel stone and our Lord came by
And he said to him, what's the matter with thee, my man?
And he said, got the toothache, master;
And he said, follow me and thee shall have no more toothache."

Another formula is this:

"Christ pass'd by His brother's door,
Saw His brother lying on the floor,
What aileth thee, brother?
Pain in the teeth?
Thy teeth shall pain thee no more."

The German forms differ a little from the English in that here the Lord gives Peter the advice to get some water in his mouth and to spit it out again. Flügel, Höfler, Kuhn, John and others recite the charm in the same words from various parts of the country. "Peter stood under an oak tree. Our Lord Jesus Christ came and said to him, 'Why art thou so sad?' 'The teeth rot in my mouth.' 'Peter, go to the ground, take water in thy mouth, and spit it out again into the ground. In the Name, † † †. Amen'."

The narration of Saint Peter's toothache and cure, which is in the possession of Freiherr von Sternbach in his library at the castle of Wolfsthurn, near Sterzing, Tyrol, dating from the fifteenth century, ends with a magic consecration formula. It reads thus: "Saint Peter sat on a stone and held his cheek in his hand. There came our Lord and said to him, 'Peter, what hast thou?' Saint Peter said, 'Sir, the worms have got into my teeth.' The Lord said, 'I conjure thy teeth in the Name of the Father and of the Son and of the Holy Ghost that there will be no power in future to dig in Peter's teeth. Ayos, ayos, ayos, tetragmaton.' If you wish to banish the toothache, tell the one who has the pain to write on his cheek the words: rex, pax, rax, in Christo filio suo."

It is very interesting that the English doctor, John Gaddesden, of Oxford (1400-1450), who had the reputation of being a great scientist and who has bestowed upon us a "textbook" of medicine entitled "Rosa Anglica," gives there the following advice for the treatment of toothache: "Write those words on the jaw of the patient: In the Name of the Father, the Son and the Holy Ghost, Amen.—Rex-Pax-Nax: in Christo filio—and the pain will cease at once,

as I have often seen." From this example we see how thoughtlessly medieval physicians have accepted nonsensical folk cures as a part of their "scientific" therapy.

Miss Burne tells of a blacksmith's wife of Shropshire, England, who had suffered from toothache and was given a charm by a young man who told her to wear it in her stays. As soon as she had done so the pain left her, and it never troubled her again. It was "words from the Scripture that cured her," she said, adding that she had relieved "a many with it." After some trouble she consented to make a copy of the talisman. It proved to be an imperfect version of an old charm, and this is the form in which the woman had it: "In the Name of God, when Jesus saw the Cross on which He was to be crucified, all his bones began to shiver. Peter standing by said, 'Jesus Christ cure all Deseces, Jesus Christ, cure thy tooth ake'."

Saint Peter seems to be the original hero of the narrative charms. But often enough we find him replaced by other saints. In Berkshire, England, Bortron is substituted for St. Peter. In an old Latin manuscript from London (Fol. 87a, Ms. Arundel 33) it is the Virgin Mary who complains about having a worm in her tooth. "In nomine patris et filii et spiritus sancti. Maria super petram maxillam manuque tenens venit filius dei et dixit ei cur sedes maxillam in manuque tenens. Respondit Maria venit ille vermiculum qui dicitur migranus et me mordet. Ihesus respondit adjuro te magrane in nomine patris et filii et spiritus sancti ut exeas et inde recedas ab hoc famulo dei ut non noceas ei in dentibus aut in membro aliquo per christum dominum nostrum amen."

Another "saint" brought in connection with toothache is Ahab, the seventh king of Israel, an obstinate idolater. The formula is literally the same as the Peter charm used in Germany, the name of Peter being replaced by Ahab, and Jesus Christ by "God." This variant is quoted from Brunswick, with the addition that the words should be spoken

three times after sunset. I believe that Ahab, here, has been confounded with the sufferer, Job, whose German name is both Hiob and Iob. Proof of this is a formula recorded by Wuttke from Wurttemberg, in which the name of Job figures in the place of that of Peter or of "Ahab."

The rest of the narrative charms is devoted to the real acknowledged patron of the toothache, Saint Apollonia.

CHAPTER XVII

ST. APPOLONIA, THE PATRONESS OF TOOTHACHE

In almost all Christian countries, particularly the Roman Catholic countries, Saint Apollonia is known as the patron of toothache. Chapels and churches were erected in her honor; her relics, her statues, the invocation of her name, brought immediate relief to the tormented sufferer.

No wonder, then, that of the 13,825 martyrs spoken of in the Roman Martyrology, Appolonia was chosen as the protector and intercessor of those afflicted with toothache. She knew, of her own experience, what healthy, intact, uninjured teeth meant to a person. She had gone through all imaginable tortures of extracting, pulling, breaking and knocking out of her teeth. In the year 248 A.D., the Roman Empire celebrated its millennial. The people were elated, proud of being Roman citizens; they admired the power of their gods who so obviously helped their believers to subdue the world. They could not understand how some of their fellow men could desert their good and trustworthy gods and turn to one who had not yet been tried and who, in fact, did but bring them misfortune and distress.

In this year of increased emotions, of excessive national pride, of disdain of everything that was not Roman, there was in Alexandria a poet or a seer, who wandered from place to place and incensed the mob against the followers of Christ. Their houses were plundered and everything that was not clinched and riveted was burned on the street. Many of the Christians, giving their belongings up, left the town, and went to safer places. Of those remaining in Alexandria quite a few yielded to the threats of the mob

and forsook their new belief in order to save their lives. A small minority, however, braved all dangers and held fast to the Christian religion. They paid for their faithfulness with their blood. Among them were Metras, Quinta, Serapio and Apollonia.

Apollonia was, according to the report given by Dionysius, Bishop of Antioch, a "virgin of advanced age." She was imprisoned, her jaws were crushed and all her teeth were knocked out. A pyre was constructed in a suburb of Alexandria, and Apollonia was asked to return to the old gods and to sacrifice to them or die in the flames. Instead of any answer, she jumped into the fire and died the heroic death of a martyr.

In later centuries, the story of her martyrdom was adorned by many additions and changes. The virgin of advanced age and daughter of unknown parents became the "offspring of ancient kings, excelling in beauty the nymphs of the Nile, brilliant through the fame of her progenitors, raised in purple, gold and rich treasures." She was changed into a "girl hardly ripe for wedding, in the blossom of her youth." Her mother was forced to watch her daughter, whom she had educated to piety, dragged to the pyre. Her teeth were knocked out, she was thrown in jail, and there several saints and an angel appeared to her and strengthened her soul. The flames had no power over her. During the night that followed her self-sacrifice, her body was taken from the pyre and buried. This is the story of Saint Apollonia's martyrdom as retold in an epic by the Latin poet and Carmelite general, Battista Spagnuoli Mantuano (1448-1516).

In another legend, written about 1470 in Augsburg, Apollonia is the daughter of the Emperor Eusebius and of the Empress Jatinia, who were unbelievers. They gave the girl to a pious woman of the family of the "Penelaupen" for education. She lived in a tower and was waited upon by twelve virgins. A wise, dignified old man by the name of

Embilianus was her guardian. She was surrounded by immense wealth; her table, her chairs, and the other furnishings were made of "red gold." Her father and her brothers gave her everything she wanted, but she did not keep anything for herself; she gave it all to the poor.

There is a variant of the story, according to which Apollonia lived in the country-seat of her parents near Alexandria. When, one day, the prefect Divinus was administering justice in the forum, she went to him and reproached him for being a heathen and for persecuting the Christians. He became angry and told his soldiers to seize her and knock out her teeth. In spite of her pain she still praised God with a loud voice.

This took place in Alexandria in the year 249, when Philippus Arabs was Emperor of Rome. A few old manuscripts, however, transplanted the legend to the capital of the Empire, Rome; the historically accredited year 249 was reduced to 135, and the ruler was accordingly not Philippus, but Julian the Apostate.

Apollonia, in this version, was the daughter of the senator Apollonius who, admiring the sacred enthusiasm with which the followers of the new religion underwent the most horrible tortures, was ordered by an angel to turn Christian. The priest, Polycarp, baptized him and his daughter Dina, who then received the name of Apollonia. Immediately after this act the sky opened and they saw Jesus Christ and the angels. At the same time an angel of the Lord appeared to them and informed them that they were going to be killed for their change of religion. Apollonius asked his wife to join him, but she became angry "like an unbridled horse," and accused her husband and her daughter of their foolishness and errors. When she came home, the devil in the shape of a dog, jumped upon her and she dropped to the earth dead. Apollonius and his daughter were taken to the Emperor. The senator, true to his newly accepted belief, was beheaded, his body thrown out and not allowed to be

buried. Apollonia was called before the Emperor again and, when she refused to sacrifice to Jupiter, he had her locked up with lions and other beasts. Her prayers calmed their wildness and cruelty; they came to her like tame puppies and lay down at her feet. Then Julian's wrath knew no limitation; he gave the order to knock out her teeth with pointed iron instruments and to pull the roots with tongs. Apollonia, in her utmost pain, prayed to the Lord that in future all those who would invoke her name for relief from toothache might be eased of their suffering. As a sign that her prayer was granted, an angel appeared to her. Julian, seeing that, notwithstanding her ailments, she held fast to her God, had her tongue cut with his sword. Her body was buried by the priest Polycarp who had baptized her. Five hundred people, who witnessed her martyrdom with their own eyes, were so moved by her

The Martyrdom of Saint Apollonia. Woodcut from the year 1473. Original at the University Library of Basle.

marvelous courage that they accepted the Christian religion.

The Roman and the Alexandrian Apollonia are undoubtedly identical. Julian was known better than Philippus Arabs (according to another variation, it was Decius) to be a pitiless persecutor of Christianity. Rome was a more popular background for the tragedy than Alexandria. No wonder, then, that the historical facts were disregarded.

The Alexandrian Apollonia, too, in a breviary printed in 1508 at Utrecht, is said to have offered herself as a patron of toothache. When her teeth were knocked out with sharp stones and she was put in jail, she prayed that those afflicted with toothache, who would call upon her for help, might be relieved of their pain. In response, a voice from heaven said, "O, bride of Christ, thou hast obtained from God what thou hast prayed for."

Those suffering from toothache did pray and still pray to Saint Apollonia. Her day, the ninth of February, is commemorated by the church; in some dioceses, as Arras, Trent, Noyon, Utrecht, Speyer, Osnabrück, Minden, Antwerp, Placencia, she had her own "officium proprium," in which her patronage of toothache is particularly referred to. The prayer contained in the breviary of Cologne reads thus: "Deus, pro cuius amore Apollonia, virgo et martyr horribilem dentium excussionem constanter sustinuit: præsta, quæsumus, ne omnes, qui ejus commemorationem frequentant, a dolore dentium et capitis semper immunes custodias, et post hujus exilii aerumnas ad gaudia suprema perducas."

This is the prayer of the breviary of Utrecht: "O sancta Apollonia, per passionem tuam impetra nobis remissionem omnium quæ dentibus et ore commissimus per gulam et loquelam; ut liberemur a dolore et stridore dentium hic et in futuro; et diligendo cordis munditiam, per gratiam labiorum habeamus amicum Regem Angelorum. Amen!"

Apollonia is very popular in Bavaria. There the people

even believe that she is a special Bavarian saint and call her "Apollonia von Bayerland." Several invocations are recorded from there:

Saint Apollonia,
A poor sinner, I stand here,
My teeth are very bad,
Please be soon reconciled,
And give me rest in my bones
That I forget the toothache soon.

. . . . .

Apollonia, Apollonia,
Thou the holy saint in heaven,
See my pain in yourself,
Free me from evil pain,
For my toothache may torture me to death.

. . . . .

Apollonia of Bayerland,
I raise to thee my right hand
And promise thee ten candles
If thou takest my toothache from me.

In Austria the sufferer from toothache prayed: "O God, for the honor of Thy sacred name, the blessed and glorious virgin and martyr, Apollonia, endured patiently the cruel knocking out of her teeth. We pray Thee, grant us, because we celebrate her glorious memory with pious devotion, freedom from the bodily toothache and from the eternal chattering of teeth, to increase her honor in Thy divine mercy, and lead us from the misery of this life to the fatherland in heaven, through our Lord Jesus Christ, Thy Son, who liveth with Thee and ruleth in union with the Holy Ghost, true God from eternity to eternity. Amen."

Many prayers and narrative charms dealing with Apollonia are reported from France. One is prayed in the Latin language:

Virgo Dei egregia,
Pro nobis Apollonia,
Funde preces ad Dominum,
Ut tollat omne noxium,

Ne pro reato criminum
Morbo vexemur dentium,
Sed sanitate capitis
Gratulemur et corporis.

A charm in the form of a dialogue is recorded by Kock and Bessières: "Apollonia, what art thou doing there?" "I am here for my Lord, for my blood, and for my toothache." "Apollonia, go back; if it is a drop of blood it will fall, if it is a worm it will die." Then five paternosters are spoken.

In a dialogue between Jesus and Apollonia we find literally the same narration which we have met in a preceding chapter in connection with Saint Peter, the Virgin Mary, and Ahab (Job):

Sainte Apolline
La divine
Assise au pied d'un arbre
Sur un pierre de marbre,
Jésus, notre sauveur,
Passant là par bonheur
Lui dit; "Apolline,
Qui te chagrine?"
—"Je suis ici, maître divin,
Pour douleur et non pour chagrin,
J'y suis pour mon chef, pour mon sang
Et pour mon mal de dents."
—"Apolline, tu as al foi
Par ma grace, rentourne-tois,
Si c'est une goutte de sang, elle chéra,
Si c'est un ver, il mourra."

This, translated, is as follows:

Saint Apollonia, the Divine, sat under a tree on a marble stone. Jesus, our Savior, happened to pass by and said: "Apollonia, who makes thee grieve?" "I am here, Divine Master, for pain and not for grief, I am here for my Lord, for my blood and for my toothache." "Apollonia, thou hast the faith in my grace; go back home, if it is a drop of blood it will dry, if it is a worm it will die."

In Spain, the conversation is held between Apollonia and the Virgin Mary: "At the door of Heaven there was Apol-

lonia, and the Virgin Mary passed by. 'Say, Apollonia, what art thou doing there? Sleepest thou or wakest thou?' 'Madam, I do not sleep nor do I wake, for I am almost dying of a pain in my teeth.' 'For the star of Venus and the setting sun, for the very sacred sacrament that I have in my lap, may thou not suffer from thy molars nor from thy teeth'."

According to Bruck, similar prayers are contained in the breviaries of Antwerp (1496, printed in Venice), of Mayence (editions of 1495 and 1507), of Ratzeburg (1506), of Speier, Konstanz and Schleswig.

Not only these prayers, but also several other facts, show Apollonia's importance as the patron saint of toothache. The one who fasts on her day, the ninth of February, will not have any pain in his teeth during the following year, in Styria and in Bohemia. In the church of Saint Augustine, in Rome, poor, young girls are given clothes on that day. In Bavaria, saying a paternoster in her name each day, saves from toothache. There is a village in Bohemia near Pilsen which is named after Saint Apollonia. Rome has a church named after her. In Bonndorf, near Staufen, there is a chapel named "Bildhüsli" (Spoonchapel), with a statue of Apollonia. If a person has a toothache he deposits at her feet the spoon with which he usually eats; and mothers whose children have difficulties in cutting teeth bring their little shirts and dresses to the chapel, and hang them up there. The good spoons and dresses are, of course, usually stolen.

In Upper Bavaria the seeds of the peony are called "Apollonia grains" and are consecrated to the saint; they are strung on threads and, if the children bite them, their teeth will come in very easily. Several plants used in the treatment of toothache are called "Apollonia root" or "Apollonia herb" in Germany, particularly in Bavaria. In Mooskirchen, Styria, in order to be saved from toothache, one has in the morning first to dry one's hands and then the

face, and on the way to mass say a prayer to Saint Apollonia.

In former times, people used to promise Apollonia some gift if she would cure them of their toothache. Kaiser Ferdinand III and his wife, Maria Leopoldina, built, after their prayer to free their son, Leopold, from his pain was granted, the chapel of Apollonia in the church of St. Augustine in Vienna in the year 1643, and adorned it with many costly oblations and relics. The Empress donated, among other things, a tooth of Apollonia which she used to wear on her neck. A silver bust of the saint worth three hundred florins was put up on the altar of the chapel. Later on, when Kaiser Joseph II ordered many of the chapels and altars of the Augustine church removed, the altar of Apollonia, too, was taken away. The silver bust seems to have been lost. On February 9, 1785, a picture of Apollonia was placed in the St. George chapel of the same church.

The Jesuit, P. Benucci, who was cured of toothache after praying to Apollonia, published in the beginning of the seventeenth century, in accordance with a promise given her, the story of her life.

Apollonia, who granted thus the prayers of her believers, punished those who did not treat her right. The Bishop of Pardubitz destroyed a chapel consecrated to her and vowed to rebuild it soon. But he forgot his promise, and the veneration of the saint diminished among the people. After the bishop's death all his teeth were found to be knocked out from his mouth as a punishment for destroying the memory of her who used to preserve the teeth of her believers.

Many places keep relics of Saint Apollonia. They have a great healing power and are as highly esteemed as the saint herself. Not all of them are genuine, for she had, like other mortals, only thirty-two teeth, and many more than that number are kept as her relics. In Rome, the

following parts of her body are preserved; her head in S. Maria trans Tiberim, one arm in St. Lorenzo fuori le mura, a part of her mandible in the church of Saint Blasius, some of her teeth in the Minorite church, in S. Maria in Campo marte, in Saint Rochus, in S. Cecilia (here, also, the tong is shown with which Apollonia was tortured), in S. Maria transpontana, and in St. Anna Volterra, in Etruria, a part of the mandible and one tooth; Bologna has the mandible, Naples has teeth, Tortona a part of the mandible with three teeth.

According to the breviary of Placencia (Spain), Apollonia's body had been shipped from Alexandria to Tortona and buried there in the cathedral "where the holy corpse beamed with many wonders." In an old chronicle of Tortona, from 1580, a sarcophagus of the Saint is mentioned which was highly worshiped by the inhabitants of the town, but at the present time only the mandible and teeth are shown.

To Antwerp, Jacob Tirinus brought "a part of the bones of the saint, virgin, and martyr Apollonia"; also a part of her jaw is kept there; in Bruxelles, in the church Ste. Gudule, there is a silver case with the arm of the saint, which formerly belonged to the Belgian princess, Isabella Clara Eugenia.

Teeth of Apollonia are also found in Mechlin, in Lille, in Douai, in the cloister Marketten near Lille, in Termonde, Artois, Mamut, Cambray, in a convent near Treves, in Essen, Venice and Vienna. A great many relics are said to be in Cologne: one arm, two (!) mandibles, one rib, and nine teeth, which are deposited in very costly vases in various churches. Also the church of St. Rocco in Lisbon possesses several parts of Apollonia's skeleton.

The great Spanish poet, Cervantes, knew very well of Apollonia and her patronage. In his "Don Quixote" the bachelor one time says to the landlady: "And on your way,

The Martyrdom of Saint Apollonia
Painted by Flaminio Torre (1621-1661). Original at the picture gallery in Dresden.

say the prayer of Saint Apollonia if you know it by heart. I shall be there soon, and you will see miracles." "For mercy's sake!" replied the landlady, "do you tell me to say the prayer of Saint Apollonia? Such prayers might be very good if he had it in his teeth, but alas! he has it in his bean."

Apollonia is not only the protector of those afflicted with toothache, but also of those occupying themselves with the cure of the affliction. Johann Georg Keissler, in his travel book, published in 1751, writes of the "tooth-breakers" in Turin: "None are more modest than the tooth-breakers, who unanimously assure one that they would pull the tooth 'con adjuto di Santa Apollonia,' who is the patron of the teeth."

A great many pictures exist commemorating the martyrdom of St. Apollonia. These are her emblems:

1. Holding a tooth in pincers;
2. Her teeth being pulled out;
3. Pincers in left hand, tooth in right;
4. Pincers alone;
5. Tied to a pillar and scourged.

There are a few more saints, nineteen altogether, who, besides their principal offices or patronage, are able also to cure toothache if they are invoked. We have met the names of the Virgin Mary, of Saint Peter, Anna, Susanna, and Sibyl in toothache prayers and charms. St. Lucy is invoked against toothache in England. St. Anna is called upon in the German part of Bohemia to cure toothache. In Ukrainia, around Kharkof, St. Antony's name occupies the place of the moon in the formulæ reported from there in a preceding chapter. St. Gertrude, too, in some regions of Germany, is brought in connection with the aching tooth. St. Agatha, whose martyrdom consisted in tearing out her breasts with a pair of tongs, which therefore form an attribute of her sanctity, is occasionally taken for Apollonia and invoked in cases of toothache.

CHAPTER XVIII

THE TRANSFERENCE OF TOOTHACHE

We meet with the employment of plants, animals, human organs and minerals, with invocations and incantations, with prayers, offerings, written and spoken charms, fasting and pilgrimage as cures in the popular therapy of toothache. There is still a very large group of practices left, which, although of various character, may be comprehended as procedures which have in common the intention of transferring the evil from the sufferer to some other subject. The place where the toothache, or its symbolic equivalent, is to be deposited, is usually a tree, but water, stones, walls, doors, ant-hills and graves may also serve as receivers of the transplanted pain. As the act consists mostly of nailing, pegging, plugging, boring or digging, it is believed that the demons causing the disease are thus being rendered innocuous; by locking them in and stopping the entrance to their new residence with a nail or wooden peg, the possibility of their freeing themselves and returning to their victims is taken from them. The individual affected with toothache has rid himself of his discomfort and imparted it to the tree or stone, which from now on is the bearer of the pain. The demon, or the ill-making, pain-producing principle, is obtained by poking the gums with a splinter or with an iron nail until the gums bleed, and then the blood-stained splinter or nail is driven into a tree. This is done not only in cases of toothache but also in a number of other conditions of ill-health.

The use of a nail—very frequently a coffin-nail or a hob-nail is chosen—for the transference of sickness is very old. Although the common interpretation of its popularity is that nails were employed at the crucifixion of the Savior, we know that the nailing of diseases was familiar already to the ancient Romans of the pre-Christian era. Livy reports from the fifth century before Christ that there was a dreadful plague in Rome, which was expelled in that a dictator, named expressly for this purpose, drove a nail into the wall of Jupiter's temple. Livy adds that this nail therapy originated among the Volscians, an Etruscan tribe, who used to beat nails into the temple of the goddess Nortia, thus indicating the beginning of a new year and keeping track of the year number.

Around the nucleus of disease transportation a great number of detailed prescriptions were formed in the course of centuries, which exhibit a different appearance in the various regions where they are carried out minutely, but still show a resemblance close enough to be recognized as having the same original source—the idea of transplanting the pain.

Pegging and nailing of toothache is very commonly, although not exclusively, met with among the Germanic nations.

Martius (De Magica) speaks of scratching the gums in case of toothache, *"dum sanguinem fundant,"* with a piece of bark, which then is returned to the tree and covered with mud. (*Et corticem reductum luto bene muni*). This, he assures, is useful in cases of habitual or constantly recurring toothache.

In Reichenbach, in the Vogtland and in other parts of Saxony, particularly the Lausitz and the vicinity of Chemnitz, small sticks are cut from trees which were struck by lightning and, under observation of certain formulæ, driven into a tree, preferably on a Good Friday before sunrise; at the same time some parts of the external integument of the

individual suffering from toothache, either finger-nails or hair, are implanted into the tree. Another prescription prevalent in Reichenbach advises to point the branch of a tree at its end, without cutting off the branch, and to stir in the aching tooth with the pointed end until blood appears. Thereupon the bloody end of the branch is fastened to the bark of the tree in such a way that a small hole is made in the bark in which the branch is fixed. Many such curved branches, whose originally free ends very often grow together with the trunk, may be seen in the surroundings of Reichenbach. If such a branch happens to be withdrawn from the bark, the toothache is very likely to reappear; the demon has been liberated from his imprisonment and there is nothing that could keep him from returning to his former residence.

In Bavaria the bark is carefully loosened in springtime from a young elder or willow on that side of the tree which is directed toward sunrise. A small splinter is cut out from the wood, with which the gums are poked until they bleed, and the splinter is refastened to the trunk and covered by the bark, which is tied or glued to the tree. As soon as the splinter grows together with the tree again, the pain disappears; if this is not the case, the operation should be repeated. Or one asks a grave-digger for a coffin-nail, with which the gums are poked to the point of bleeding, and the nail is hidden in the ground. The Bavarians also combine the use of written charms with the nailing of toothache. They take a hobnail, go to a place where three roads are crossing and write with the nail these signs on the ground: "Rex, Pax, Max, ppo, in Folio." Then the nail is driven into a door. Following another prescription, the one suffering from toothache goes to an elder-tree, armed with a pocket-knife, and addresses the tree with these words: "Dear Frau Elder, lend me a splinter which I shall return to thee." Then he loosens a piece of the bark, cuts a stick off the wood, and goes home. There he scratches his gums

with the stick until it becomes red with blood and returns it to the elder, where he refastens it in order to transplant the toothache to the tree.

In Pforzheim, Baden, the toothache is apt to come back if the tree into which the pain has been transferred happens to be hewn. In Reckingen the patient's toothpick is hidden in the branches of a willow-tree.

In Stiefenhofen, Allgäu, the chip, or a toothpick, with which the gums were scarified, must be attached to a cherry-tree. In Namlos, a village in the same district, one goes before the morning prayer—beware not to speak a word on that morning!—to a weeping willow growing near a brook, cuts a splinter from the tree and stirs with it in the gums until they bleed, and the toothache will disappear. In Immenstadt one is free from toothache if one drives three nails into a beech on a Good Friday. In Schindelberg one pokes his teeth with an iron nail, which is beaten into some place on the floor of the cellar "where neither sun nor moon shine." If an inhabitant of Immenstadt is vexed with a toothache, he may also poke around the tooth with a hobnail which had already been in a horseshoe. Then he goes, "uncalled and unseen," to a crossway and, kneeling down, scrawls with the nail these words on the ground: "Rex, mex, Hex, the tooth shall never be hollow." At home, the nail is driven into a rafter where sun and moon never shine. The people of Ebenhofen and Altdorf, Allgäu, combine a religious meaning with the procedure; they take the splinter from behind the altar of the Pilgrim Church at Ottilienberg, near Biesenhofen.

In Thuringia, too, the transplantation of toothache is given a religious, Christian note; the operation is accompanied by the thrice-repeated saying of the paternoster; then, poking the tooth with a nail which was found in a grave causes its falling out without pain. The act must be carried out silently in the name of the Lord; Good Friday usually is chosen for the procedure. In the Fulda valley

one goes silently on an Easter night to an apple-tree, holds the right foot against the tree and utters the following words:

New heaven, new earth;
Tooth, I command thee
That thou doest not swell nor fester
Until Easter comes again.
In the name of God, the Father, the Son, and the Holy Ghost.

This is spoken three times and followed by a paternoster. During the whole year the tree should not be visited by the patient again.

The Franconians rid themselves of toothache by touching the tooth with a coffin-nail which had been unearthed for this very purpose; the nail may, or may not, be fastened to a willow-tree afterward.

Coffin-nails help also the Frisians in the case of toothache.

In Mecklenburg someone who is not related to the patient—kinship renders the magic ineffectual—makes a cleft in a tree at its north side and cuts a splinter out, with which he stirs in the sufferer's gums until they bleed, whereupon he puts the chip back to its original place. The whole act must be performed in silence. When the splinter grows together with the wood of the tree, the toothache leaves for good.

In Brunswick it is not considered necessary to reimplant the staff taken from a tree. The procedure is the same as in the other examples cited, but after soaking the splinter with the blood from the scarified gums, the patient has to carry it with him. If he loses it the pain reappears at once. The tree from which the chip was taken must have been struck by lightning, as is required also in Saxony. Another method of getting rid of toothache in Brunswick is to touch the ailing tooth with a nail, which is then driven into a tree, preferably a linden-tree. This act is accompanied by the utterance of the following words:

Nail, I complain to thee,
My tooth, it bothers me,
In me it leaves,
In thee it stays,
It won't have anything to do with me forevermore.

In the Palatinate, after returning the bloody splinter to its original place, one shall never again come back to the tree from which it was taken, or the toothache once banished will again take possession of the patient. Another prescription is recorded from the Palatinate by Heeger: Take a new nail, stir with it in the teeth until blood flows, then drive the nail in a place where neither sun nor moon shines, into the wall of a cellar, toward sunrise; name during the first stroke the individual whom you expect to help, and say this:

Toothache, flee at the second stroke,
Toothache, cease at the third stroke,
Toothache, go away.

The people of the Province of Brandenburg use a nail in place of a splinter; they work their charm at the time of the waning moon, and choose an oak-tree for the operation. As long as the tree exists, the individual will be free from toothache. There, too, as in Mecklenburg, the north side of the tree is selected; this, according to Wuttke, reminds one of the heathen time when the residence of the gods was believed to be in the far north, or it may simply indicate that direction which is turned away from the light. In Fehrbellin, Brandenburg, one takes a nail which was found in the earth and drives it into a tree, yet so that it can be extracted with the hand; then one blows his breath three times into the hole, saying each time: "In the name," etc. In Lichtenberg, near Berlin, the aching tooth is poked with a nail to the point of bleeding, whereupon the nail is beaten into a tree on that side which is directed toward the water, in the name of, etc. People also borrow a small

nail with a thick head from a neighbor, poke their aching teeth with it and beat it into an oak-tree, which stands on the border of a forest; after this, one shall never return to the place.

The Prussians take the dry root of selfheal, Brunella, and rub the gums with it to the point of bleeding; they bore a hole in a willow, place the root in the hole, which is closed with a small piece of willow wood. This is an infallible remedy against toothache.

If a Styrian is afflicted with toothache, he has the choice between three various procedures of transferring his illness. He may take refuge to an elder-tree just as the Bavarians do, but does not have to bother with the formula that forms an indispensable part of the Bavarian ritual, nor is he restricted to the time before sunrise. Or he may, if he prefers to do so, gnaw off a piece of the bark of a shrub and spit it out again; in this case he is not allowed to look back as he leaves the place. The splinter taken from a coffin is just as efficient; the patient pokes the gums with it to the point of bleeding and drives it into a tree or deposits it in some other place where neither sun nor moon ever shines. In this latter case, a nail may be used instead of the splinter.

In the Tyrol the instrument used is a rusty nail, and the place where it ought to be deposited must be hidden from the sun and from the moon.

Huemer saw in Kirchdorf, Upper Austria, hundreds of hobnails in a shed door, arranged in almost regular rows. The farm to which the shed belonged was run by a man who had a wide reputation of being an infallible healer, and people even believed he was omniscient. He was a specialist in the cure of toothache. The patient was ordered to fetch a hobnail from the near smithy without asking for it or thanking after he got it. Then the farmer went with the sufferer to a cross-way, and made, leading his hand, various signs on the ground with the nail, whereupon the patient

was told to drive the nail into the shed door with three strokes. This act was followed by instant recovery.

An old prescription in the Bernese Oberland (Switzerland) advises taking an iron nail and digging in the tooth with it, then beating it into a tree, with the face turning toward sunrise; the tooth will soon be well. A splinter may be used in place of the nail.

The Germans of Transylvania bore a hole in a tree and chew, while standing near the tree, a piece of bread with the ailing tooth; one-half of the bread is swallowed, the other half is plugged into the hole, during which procedure the patient says: "Tree, I give thee one-half of what I possess; take from me all of my pain and conduct it to the ground."

In England the gums are cut with an iron nail till they bleed, and then the nail, with the blood upon it, is to be driven into a wooden beam up to the head. When this is done, you never will have toothache again all your days. Some say that to drive a nail into an oak-tree is sufficient to cure toothache.

The transference of toothache is known also among the Slav nations. In Bohemia the pain is stoppered on fast growing trees, particularly osiers, elders and hazel-bushes. The gums are scarified with a splinter cut out from one of these trees and the bloody chip is returned to its place, whereupon the tree wound is covered with clay. An iron nail may be used for the same purpose.

The inhabitants of western Bohemia may choose among a great number of varieties. They may pick the gums in the region of the ailing tooth with a small piece of elder or hazel-bush wood or of a coffin board, or of a cross standing at a road-crossing, and if the instrument is soaked with blood, it may be deposited under the ridge of a roof, or in the trunk of the tree from which it was taken, or in the ground near the root of that tree. In each case, five paternosters should be prayed.

The Slavs of the Balkan employ the method of nailing the toothache not only in a therapeutic but also in a prophylactic sense. They transplant not only the actual toothache but also all possible future occurrences of the sensation. If the child loses the first deciduous tooth, an old woman bores it into the trunk of an old willow-tree and covers the opening with a peg. If this is done, the child will never be bothered with toothache.

In northern Lithuania a splinter is cut from a young tree in which a hole is bored; the teeth and gums are picked with the splinter (usually a friend or somebody else is requested to do the picking) until they bleed. Then the chip is placed in the hole and fire set to it. The patient turns his back on the tree and, after leaving the place, shall never see the tree again.

In Poitou, France, it is believed that toothache disappears if one drives a nail into a door with a hammer.

In Jewish folk-medicine, one prescribes the driving of a nail into the wall, the formula, "Adar Gar Vedar Gar," being uttered, and then followed by these words: "Even as this nail is firm in the wall and is not felt, so let the teeth of So-and-so, a son of So-and-so, be firm in his mouth, and give him no pain."

The Syrian "dentist-sorcerers" take a piece of wood and an old hobnail from a mule; while they mutter their prayers and charms, the patient is ordered to press with one finger hard against the ailing tooth. In the moment when the sufferers shrieks out from the pain caused by the pressure, the "doctor" drives the old hobnail into the wood —once, twice, three times. "If it helps, it's all right; if it does not help, then it's all up to Allah."

The negresses of Virginia, United States, take the patient before sunrise to a churchyard, where he must sit down under a fir tree. Then they make with a knife an incision in the tree and peel off the bark. The gums are scratched to the point of bleeding, and after inserting a few drops of

the blood into the tree wound, they return the bark to its place. No third person should be allowed to witness the performance.

The transference of toothache to a tree need not necessarily be combined with the act of nailing or plugging. In Anhalt, Germany, it suffices if one kneels down in an orchard in front of a pear tree at the time of the waning moon, and says: "Pear tree, I complain to thee, the red worm is pricking me." In Kremmen, Brandenburg, the patient places three fingers of one hand in the palm of the other hand, thus touches a cherry tree, an apple tree and a pear tree in the given order, and each time he has to say this verse:

Cherry (or apple, or pear) tree,
I come to thee,
The tearing and festering bothers me,
Take from me,
Keep with thee,
In the name of God.

In Potsdam these words are uttered:

Apple tree, I come to thee,
My teeth do bother me,
The first bird that flies over thee
May take the pain from me.
In the name of God.

When the first line is spoken, the tree is touched with the right hand; during the second line, with the left; at the third, the right hand reaches higher up; at the fourth, the left hand touches the same place, after the right has been taken away.

A pear tree is invoked in Friedrichshagen, near Berlin. The patient touches the tree, then marches around it three times, and says:

Pear tree, I complain to thee,
Three worms, they bother me,

The one is gray,
The other is blue,
The third is red,
I wish they were all three dead.

In Westphalia, one touches an elder tree with the hand of that side where the ailing tooth is located, and says three times:

My teeth are aching,
A black one, a white one, a red one,
I wish they would bleed to death.
In the name of God the Father.

Not only trees are capable of receiving diseases and either retaining them for themselves or conducting them to the grounds, but stones can do this just as well. Near Mansfield there is, according to Grimm, a stone full of such nails. In Swabia the people have a very peculiar way of conducting their toothache into the ground. They lift a stone from the street, spit three times upon that side with which it had touched the earth, and place it back in the same position in which it had been before. All this must be done by the patient when he is certain that nobody is watching him.

Oftentimes the pain is transplanted directly to the earth without using a tree, or a wall, or a door, or a stone as a medium. In Thuringia the patient may rid himself of his toothache by the following procedure: He cuts a piece of turf out from the cemetery, blows three times into the hole and places the turf back, saying: "In the name of God, the Father, the Son, and the Holy Ghost." In Anhalt toothache disappears if one silently makes a hole in a grave in the churchyard at midnight, takes a mouthful of grain, and spits it into the hole. He must, however, be sure and select the grave of an individual of the opposite sex. The ill-making principle is transferred to the ground through the spittle or through the grain. In Brandenburg toothache is cured if the patient chews peas with the ailing tooth

in the churchyard and then throws them into a newly made grave. Or one takes a mouthful of salt and goes with it in the evening silently, without greeting or addressing anyone, to the churchyard. There one makes a small hole over the last grave, crosses two blades of straw over the hole and spits the salt upon it. Then the hole is closed with mud, and the patient goes back home as silently as he came. The toothache will disappear and never come back again. In the surroundings of Würzburg, the patient must go alone to the churchyard in a full moon night and dig up the earth over the last grave with his bare hands until he feels the coffin with his fingers; then he shall go home silently, and he will be freed from his toothache.

An ant hill serves for transplantation of toothache in Aussee, Styria, and in western Bohemia. In Styria one chews a crust of bread with the ailing tooth and spits it upon an ant hill without looking back as he leaves the place. In Bohemia there is a similar prescription; there, too, "incense" taken from an ant-hill helps against toothache.

The people of the Rhenish part of Prussia have a very peculiar method of transferring their toothache to other individuals by means of a broom. They place a broom on the floor of the church and believe that the one who happens to pass first over the broom becomes the new bearer of the pain of which the former sufferer has rid himself by the ceremony. Wuttke tries to explain the significance of the broom with these words: "It seems that the broom has some relation to Donar (thence the term, Donnerbesen, thunder-broom, used in Silesia and in Brandenburg); perhaps a symbol of the lightning as it disperses into a tuft of rays, perhaps because of a—not yet certain—relation of the broom-shrub, Sarothamnus vulgaris, to Donar."

There is also a prescription against toothache among the inhabitants of the Spreewald, in which the broom plays an important part. There you are told to take an old broom and hold it over an open fire until it begins to burn.

Then move it about to make the sparks fly around and inhale the smoke.

As we have learned in a preceding chapter, dealing with written and spoken charms against toothache, the pain caused from diseased teeth may be transferred to running water. In Swabia one goes—nobody should address you that morning—before sunrise to a brooklet and scoops, with one's legs straddled apart and bending backward down to the water, a mouthful of water, which is spit out again backward. This should be done three times in succession and each time accompanied by the utterance of the three names of the Trinity. In the Odenwald, in Franconia and Swabia, and near Würzburg, the one suffering from toothache must go to a well, take a mouthful of water, keep this in the mouth for a while, then spit it out again into the well, and say this three times:

I go to the ground,
  Take water in my mouth,
  And keep it in my mouth,
And spit it again into the ground,
So my teeth, in Jesus' name, be sound!

The Transylvanian gipsies wind a blade of barley straw round a stone, throw it into running water, and say this:

Ache, O thou wild dental ache,
Do not make my body shake,
Leave me now with hasty pace,
As my face is not thy place.
And please visit me no more,
Since thou makest me so sore.
Sink as deep now as this blade,
That I always thee evade.

Very probably the washing prescriptions for those afflicted with toothache are connected with the transplantation idea. In the Allgäu the patient obtains relief by washing his hands and feet in a running fountain between eleven and twelve o'clock. The Magyars, on the

contrary, will lose their pain if they keep from washing on Tuesday. In Neu-Ruppin, Brandenburg, you shall wash first your face, then the neck, and finally the hands, but they must be dried in the reverse order. The people of Kansas, U. S., are supposed to dry first the left hand and then the right after washing. In Poitou, France, drawing water from a very deep well protects against toothache. In the Tyrol baths taken at Christmas or on Ash Wednesday free the aching tooth from its pain.

The transference of toothache very often is carried out with the help of finger-nails, or of hair, or both. There may be some truth in the statement made by Schütte, that the people forgot that "the nail must be one of iron or wire" and thought of finger-nails instead. The use of finger-nails in the transference cures, then, would be based upon a philological error, and from the finger-nails the magic significance might have been extended later to the employment of hair. It is indeed a fact that the inhabitants of Wedtlenstedt, near Brunswick, if bothered by toothache, cut the nails from their fingers and their toes on three successive holidays and bury them in the ground after sunset, accompanying the act with the same formula ("Nail, I complain to thee, etc."), with which, in other parts of Brunswick, an iron nail is addressed when driven into a tree. I do not believe that the philological resemblance is alone responsible for the use of finger-nails and hair for the purpose of toothache transplantation. These organs have always played a very important rôle in magic charms. Almost everywhere the custom is found of depositing them on certain places so that they may be found after death. Their loss would greatly interfere with the expected reincarnation.

Considering the fact that teeth, too, have the same fate after leaving the oral cavity, their folkloristic relationship to finger-nails and hair becomes quite evident. If we think

of the belief in the demonologic origin of diseases, we are led to the assumption that, in the case of toothache, the demons causing it ought to be pacified with something. As the patient wants to keep his tooth and to get rid of the pain, he offers another organ instead, an organ the removal of which causes no discomfort, that is, finger-nails or hair, or, as seen above, some blood taken from the gums by scratching them with a splinter or with a nail. According to Wuttke, nails and teeth "as the only hard parts of the external body, are considered as having a mutual relationship."

Around 1750, there lived in Bavaria an old farm-hand who could cure people from toothache and headache and from other ailments by wrapping a few hairs and cut finger-nails of the patient in paper and plugging them into a fruit-tree. The artist, Fischer, watched this act one day and withdrew the plug and the paper in which the hair and the nails were contained, with the result that the girl who should have been cured by the procedure had horrible toothache for two months. "Gradually most fruit trees in the environs died, but the people were always relieved."

In the Bernese Oberland a hair is pegged into a tree, and the people believe that the toothache will not reappear until the tree is hewn.

In Brandenburg this is a good remedy against toothache: You cut first the nails of the left foot, beginning from the little toe and proceeding to the big toe, then the nails of the right hand from the little finger toward the thumb; the same is done to the right foot and to the left hand in the same order. At each nail you say: "In the name of God, the Father, the Son and the Holy Ghost." Then you ask somebody for a quill, put the twenty clippings into it, go to a tree, make a hole in the tree and put the clippings in this. The hole should be closed in the name of God, etc.

In Martinszell, Allgäu, the clippings are wrapped in a linen rag, a hole is bored in a pear tree; in this the rag is placed and the hole closed.

The original act of cutting the finger- or toe-nails and depositing them in a tree or somewhere else was simplified in a later time. The mere fact of cutting the nails on certain days or under certain circumstances or in a certain order sufficed to free the patient from his toothache. Friday is a good day for getting rid of toothache by cutting the nails of fingers and toes in Saxony (Chemnitz), in Swabia, Silesia, the Tyrol, Styria, Lauenburg, in Bromberg, Prussia (on Friday morning), in Weitnau and Martinszell, Allgäu, in Bohemia and in Holland. Of all Fridays the best and most efficient is Good Friday. In Brandenburg one is free from toothache for the rest of the year if one cuts the nails of fingers and toes crosswise on Good Friday before sunrise. In Aschau, Allgäu, one has to cut the nails on Good Friday, too, and to pray five paternosters. In Thuringia you are advised to do this on Good Friday and on each following Friday.

In Mecklenburg one cuts on Friday before sunrise or after sunset first the finger-nails of the right hand, then the toe-nails of the left foot, then the nails of the left hand, and finally those of the right foot, "probably in order to form a cross." If, on one of the other days, it becomes necessary to remove a nail, one should not cut it but tear or bite it off. The nails may or may not be buried afterward.

In Mariazell, Styria, the best time for cutting the nails is the first Friday at the time of the waning moon. The clippings are wrapped in paper and carried silently before sunrise to a lone place, where the little package is thrown backward over the shoulder, but beware of looking in that direction. This is accompanied by three paternosters. The act should be repeated on three successive Fridays.

In Franconia and Bavaria one is relieved from toothache if one cuts the nails, beginning with the little finger each

Friday at eleven o'clock. The clippings obtained on Good Friday should be buried in a little bag.

In Berlin you shall cut the nails of the right foot and left hand on one Friday, and of the left foot and right hand on the next Friday; on the third Friday, the same as on the first, and so forth.

CHAPTER XIX

DENTAL SURGERY

Extraction of teeth, the most radical of all toothache remedies, is one of the oldest operative measures. The adage, "Better a tooth out than always aching," arose from the fact that these organs could be removed without damaging the body or any of its vital functions as would the removal of any other organ. Furthermore, nature teaches the most primitive peoples that children shed their teeth without any future disadvantage and even get new teeth in place of the cast ones. There exists, in fact, a very common superstition that extracted teeth, not only deciduous but also permanent, may grow again. Pliny assures his readers that teeth fall out in old age, and then spring up again; "of this there can be no doubt." He reports a case in which the teeth appeared after the one hundred and fourth year. This hope of a possible replacement of removed teeth by Nature, the observation made in children, and the strong desire to get rid of the tormenting toothache at any cost, led at a very early period of civilization to the practice of dental surgery. Of the ancient Egyptians Herodotus, the Father of History, says that in their country dentistry was practised as a specialty. "Egypt," he says, "is quite full of doctors: those for the eyes, those for the head, some for the teeth, others for the belly or for occult maladies." In the Egyptian department of the New Museum of Berlin there is among knives, tongs, metal staffs for cauterization, etc., an instrument having the shape of a "goat's foot," which, according to Busch, might have served for the extraction of teeth. Some of the frescoes

found in Thebes and Memphis portray the act of the removal of teeth; the instruments on those pictures are very crude and primitive and of enormous size, and remind one rather of torture-implements than of medical or dental tools. It may be remarked that one finds no mention of dental or oral surgery in the papyrus of Ebers. In Egypt, the extraction was mostly performed by priests.

The surgical removal of teeth was well known to the Hebrews, but they had no special dentists. The physician, "rophe" or "asia," took care of his patients' teeth. Extraction was not very well liked, it was only employed if nothing else helped. In the Talmud we read that Rab gave his son the advice never to have any of his teeth pulled. Rabbi Chananel warns particularly against the removal of an eye-tooth; the extraction of such a tooth may have a detrimental effect on the eyes.

In the temple of Apollo at Delphi an instrument was found, which had been used for the extraction of teeth. Cælius Aurelianus gave an account of this tool, which was called odontagogon or odontogran. It was made of lead, from which Erasistratus concluded that teeth should not be extracted unless loose enough to be removed with a leaden instrument, otherwise the forceps could have been made of a firmer substance, such as iron or steel. Others believe that this was only a model placed there, perhaps by Æsculapius, the God of Medicine and son of Apollo, to be reproduced with an iron instrument by those wishing the copy, lead being less affected by corrosion, and therefore more lasting. According to Cicero, Æsculapius Tertius, the son of Arsippus and Arsinœ, had been the first to extract teeth (about 1200 B.C.).

In a Sanskrit text on minor surgery, Salukya, dating from the fourth pre-Christian century, several instruments for the removal of teeth were mentioned.

Among the Romans, extraction of teeth was practised by three different groups of people:

1. Medici, the regular physicians, what we would call to-day "general practitioners."

2. Medici artifices dentium, physicians specializing in dentistry.

3. Artifices dentium, or dentists.

The first Roman dentist of whom there is any recorded information was a man by the name of Cascellius, of whom Martial says that he "extracts or cures diseased teeth."

Celsus warns against the removal of the upper teeth: *extractio majore periculo in superioribus dentibus fit, quia potest tempora oculosque concutere.*

If there was a large hollow in the tooth to be extracted, the Romans filled it either with lint or lead, in order to prevent the tooth from breaking under the pressure of the instrument. They also surrounded the aching tooth with finely pulverized lead (molybdus), which had laid in vinegar for forty days, and protected the neighboring teeth with wax; this was supposed to make the teeth come out easier.

In the Middle Ages, extraction was practised by the following:

1. Physicians.
2. Barbers and smiths.
3. Monks and priests.
4. Quacks.

It is very difficult to discriminate just where the folkloristic part of dental surgery ended and where the professional, "scientific" or semi-scientific part began at that time. There is no question but that until about the middle of the eighteenth century popular dentistry had usurped a large territory of dental therapeutics. Up to the day of Pierre Fauchard legitimate dentistry itself was on a very low level, and if we peruse the literature of those centuries which preceded this great reformer, we find that most of

the writers who had something to say about the teeth were not ashamed to recommend the same remedies and methods which, to-day, we should absolutely call superstitious or folkloristic. No wonder, then, that the itinerant tooth-drawers, moving their fantastic booths from market to market, enjoyed a good "practice," very successfully competing with their learned rivals. Socially, of course, they were considered as low as the tramping gipsies; they were compared with beggars, because, like beggars, they wandered from village to village, from kermess to mart, from fair to festival, using their roaring voices as their chief advertisement and attempting to draw not only their patients' teeth from their mouths but also their money from their pockets. They did not care a particle about cleanliness, it did not matter to them whether they got hold of the sick tooth or a sound one, whether they left a root in the jaw or broke a part of the neighboring crown. Their instruments were as crude and primitive as their trade; they used tongs which originally were designed for some other purpose, curved nails, and similar implements. The people spoke of these men as tooth-breakers, tooth-pullers, tooth-drawers, or called them the "shouters" from their mode of announcing their trade. Although they had plenty of customers, these same people who sought help from them had very little confidence in their skill. They were a popular laughing-stock. Proverbs were coined, which deride their characters. The French say of a liar: "*Il ment comme un arracheur des dents*" (He lies like a tooth-drawer). The Germans do not like to hear one "shout like a tooth-breaker." They also characterize any radical measure as a "tooth-doctor." If, in the Province of Lausitz, a boy receives a drastic punishment, his father says to him occasionally: "May it be a tooth-doctor to you." Nothing demonstrates better how large the number of quacks and charlatans was who worked on the teeth, than the remark made by Pierre Fauchard:

"There will shortly be more dentists than persons affected with dental diseases."

The extraction of eyeteeth is dreaded everywhere, for their roots are believed to extend upward to the eyes; the removal of these teeth would cause ocular diseases.

Even in our day the practice of dental surgery is not restricted to the learned profession. There are many villages in the European countries, where the smith and the barber still perform their traditional function of drawing the teeth. In Styria, according to Fossel, there are not less than thirteen types of people who take care of aching teeth:

1. The peasant doctor,
2. his wife,
3. the midwife,
4. the bonesetter,
5. the chirurgeon,
6. the tooth-drawer,
7. the smith,
8. the flayer,
9. the bleeding—and cupping—men and women,
10. the faith-healer,
11. the storekeeper,
12. the pharmacist,
13. the minister.

The instruments which are used by those people are mostly old extraction tools, which were scientific in their time, such as the "pelican" or the "key."

In Swabia the extracted tooth must be burnt, then the wound will not discharge matter. The Dalmatians think that it is very good if, after the removal of a tooth, as much blood as possible is allowed to flow from the wound, which makes the "bad blood" leave the system; to make the wound heal fast, they press the opening together and rinse the mouth with rosemary. They believe that upper teeth are removed with more danger than lower, because the upper teeth are seated in the head, and the lower only in the jaw.

There is a popular belief that no matter how badly the tooth may ache, the pain may stop in the dentist's waiting-room. Many cartoons made, and still make, use of this superstition or, we may say, actual experience, which has a very clear psychological background. The fear of the operation makes one forget the toothache. The Dalmatians, in such a case, even believe that the aching tooth may be directly frightened (pripo se zub).

In Thuringian festivals and in their spinning-room entertainments, a play portraying the removal of a tooth by "Doctor Eisenbart" is one of the most popular amusements. Berthold Auerbach depicts such a scene most delightfully in his story of "Florian and Kreszenz." This play was called: "The Patient." The doctor had a man before him who pretended to be terribly vexed by a toothache. He shaved the patient first with a large garden implement, commonly used to chop off the branches of trees. With this he cut off the patient's beard, consisting of flax. Then he "pulled the bad tooth" with a huge tong. There, the chair falls down together with the patient who pretends to be dead. The doctor makes all kinds of attempts to revive him, until finally he pulls a mouthorgan out of his pocket and, dancing about the patient, plays on it. The intentionally false tunes make the "dead" patient shake all over, he jumps on his legs, catches the doctor and swings him about several times, which for the onlookers is an indication that the general dance is beginning.

The Chinese did not know the use of tongs for the extraction of teeth. They rubbed the gums with a certain powder or paste to loosen the aching tooth and then pulled it with the help of a lever-shaped instrument. The Japanese loosen the tooth first with the aid of a wooden staff and a hammer and then pull it with the fingers, which they do with admirable skill.

In Southern Arabia the teeth are removed in such a way that a small wooden plug is held to the tooth and a heavy

stone beaten against the plug. Two or three beats suffice to knock out the tooth together with the root or roots, respectively.

In Turkey, the regular dentists, called "dishtshi," find great competition in the quacks who have booths similar to those which existed in the European countries during the Middle Ages. These booths are usually decorated with long strings of extracted teeth as advertisements.

A Turkish anecdote tells of the skill of the Jewish dentist, Abraham Biwas, who took care of the teeth of the Sultan Mahmoud II, the suppressor of the janizaries and promoter of military reforms (1785-1839). One time the sultan had severe toothache. He called for Biwas and complained to him about his pain. The sultan happened to be in his park near a brook. The dentist asked the sultan to show him the aching tooth. But as the brave destroyer of the janizaries was afraid of the little operation, Biwas had the instrument hidden in the hollow of his hand. Inspection and extraction were done in a second. The next moment Biwas jumped into the water and called aloud, with a lamenting voice for help, as though he had fallen into the brook by accident. The sultan, full of pity for his dentist, forgot the fright caused by the unexpected extraction of his tooth, and the pain that followed the operation, and ran for help. He gave Biwas new clothes and rewarded him royally for his dental skill and his presence of mind.

Many savage peoples knock out their teeth as a tribal custom, a detailed description of which is given in another chapter. Here we are concerned only with the removal of teeth for the relief of toothache. Several explorers relate the use of special instruments for this purpose from various savage tribes. The Haussa have such an instrument which they call "massasaki" and which is used for the loosening of the teeth. They also have tongs for the extraction, which

they call "awarteki." For this armamentarium they have a particular leather case.

The negroes of Togo have tongs for the removal of teeth. Schrammen described one in a report made to the Dental Association for Lower Saxony; the instrument itself is kept at the Museum of this association at Hanover. It is a strong, precisely closing flat instrument, the jaws being about one-half centimeter thick and roughened on the inside by longitudinal and transverse furrows.

The Bawenda in northern Transvaal remove teeth by simply breaking them out with the points of their lances or with the aid of chisels. The Washamba use a knife or a lance. The Wadjagga beat the tooth with a pointed stone until it becomes loose and then remove it with the finger.

Besides the extraction of the aching tooth there is another form of dental surgery which is practiced occasionally by a number of people in Central Europe; we mean the cauterization of the dental pulp. The Franconians "kill the worm" by introducing a hot iron wire into the hollow tooth, so do also the Styrians. The Czechs around Eger touch with a red-hot knitting needle the place behind the ear lobe and hope thus to pacify the dental nerve; they accompany this performance with a prayer.

The Chinese, according to Taylor, used to puncture the gums as well as distant parts of the body for the relief of toothache. For this complaint alone they had not less than twenty sites for puncturing, having three hundred and eighty-eight sites altogether. They used gold, silver or steel needles, and cauterized the site afterward with a cone of moxa, a sort of slow-burning vegetable wool applied through a hole in a coin.

It is not by any means insignificant for you to know just on what day of the week you should have your teeth extracted. According to an English schedule, to get your teeth pulled means:

On Monday, approaching sadness;
On Tuesday, legacy from a distant relative;
On Wednesday, loss and shame;
On Thursday, success in business;
On Friday, confusion in affairs;
On Saturday, discovery of a secret;
On Sunday, a love quarrel.

CHAPTER XX

DENTAL TECHNIQUE

The ancient Egyptians and the Etruscans were the first nations known as practicing dental technique. As to Egypt, the reports are very contradictory, it is true, but it is an undoubted fact that even if there be some mistakes about the dentures of certain mummies, the technical part of dentistry in some form or another reaches back as far as the Pharaonic era. According to Linderer, artificial teeth roughly fashioned of wood were found in Egyptian sarcophagi. A note in "Deutsche Monatsschrift für Zahnheilkunde" of 1908 tells that the mummy of an Egyptian Pharaoh was discovered, whose mouth was supplied with a complete set of artificial teeth; the plate was made of wood, the teeth consisted of metal buttons. In 1862 a specimen of Egyptian origin was unearthed at Saida (the ancient Sidon), where several teeth were found wired together. For some time statements could be found in dental journals, usually one author quoting the other without personal investigation of the truth, according to which Egyptian mummies were said to exist which show evidences of gold fillings. None of the modern writers has been able to locate the whereabouts of such a mummy. The discussion as to whether these fillings were inserted during life or as a part of the embalming process is therefore futile now, since not a single mummy could be traced bearing evidence of such work.

The Etruscans made bridges of gold rings holding ox teeth for the purpose of replacing lost dental organs. Such a piece was found in a Cornetan tomb of the fifth pre-

Christian century. It consists of a series of gold rings skilfully united, and is now kept at the Civic Museum of Corneto, Italy.

The dental prosthesis of the Romans was apparently an inheritance from both Etruscans and Grecians. Cicero quotes a very old sumptuary law, the "Law of the Twelve Tables," dating from about 450 B.C., forbidding gold to be placed in the tomb with the body, but especially excepting the gold used in fastening the artificial teeth. These "auro dentes iuncti," according to Hermann, had been taken over from the Solonian legislature. Lucian mentions an old woman who had in her mouth four teeth united with gold wire. In an Apulian tomb a piece of seven teeth was found, which were fastened together in the same way. Taylor, in his History of Dentistry, tells that a gold crown is now in the Museum of Pope Julius in Rome, which was discovered in excavating at Satricum. "The appliance found at Satricum was made of two plates of gold stamped to represent the labial and lingual surfaces of the lower central incisor, and were then soldered together to form the crown of the tooth. It is soldered to a narrow strip of gold which is contoured in such manner as to encircle the neighboring teeth, which act as a support for the appliance." At the time of the Roman emperors false teeth must have been very common, for we find allusions to them quite frequently in the contemporary literature. Horace, speaking of two old witches, says: "You would have laughed to see those two old witches run toward the town, losing in their flight, Canidia her false teeth, Sagania her false hair." Martial refers in several places to false teeth. He says of one of the fair ladies of Rome:

> "False teeth and hair flaunts Laelia shamelessly,
> But not false eyes, for these she cannot buy."

Or:

> "Laecania has white teeth, Thais brown.
> How comes it? One has false teeth, one her own."

He makes a tooth powder say to a matron who has no teeth of her own: "What have you got to do with me? Let a girl use me. I am not accustomed to clean bought teeth." And again he says: "She at night lays down her teeth, just as she does her silken robes."

The Hebrews at the Talmudic time were well acquainted with dental prosthetic work. Artificial teeth, which could be taken out of their place at any time, were called: "shen thothebeth." The Talmud never mentions artificial dentures in a man; they are treated as a part of women's jewelry. A woman may remove such a tooth very easily from her mouth, she may take it out to show it to a friend, she also may lose it in the street. The Gemara speaks of a tooth of silver, the Mishna of a gold tooth, the commentators also mention an artificial tooth made of wood. The golden tooth was, of course, the most expensive, and only wealthy ladies could afford to have one.

Rabbi Ismael knew a girl who had a "shen thothebeth" which was very poorly made and spoiled her looks so much that nobody wanted to marry her. He had a good tooth made for her instead, and very soon she was happily married.

The manufacture of artificial teeth among the Hebrews lay in the hands of the mechanics.

Maimonides, the great Jewish rabbi, philosopher and physician, who lived in the twelfth century, understands under the gold tooth of the Talmud a golden husk with which the women used to encompass their decayed teeth to make them look better.

This has a parallel in a custom reported by Landor from the Tibet. Almost all Tibetans have bad teeth. To protect them against further damage, they surround them with husks made of silver.

The Hindus used to fasten loose teeth by means of gold wire. Briggs tells of a battle in which General Kutub-ud Din, the builder of the tower near Delhi, killed a raja,

whose corpse later was recognized by his artificial teeth bound together with gold wire. According to Roberts, the Hindu natives fasten loose teeth with a ∞-shaped sling of wire. In Madras, Roberts had a chance to acquire such an appliance formerly owned by an Indian queen. It consisted of all lower teeth which had been kept together with gold wire.

Of the Arabians we know that the third Caliph, Othman (574-656 A.D.), was said to have had teeth fastened with gold. Muhammed Ibn Sad, who in his biographies gave a complete description of this Caliph's clothes and appearance, says of him: "His teeth were fastened with gold." And Jaqubi, another Arab historian (about 900 A.D.), tells that Othman's teeth were "bound together with gold, which made his beard appear yellow."

The present-day Dyaks of Borneo have artificial teeth of which they are very proud. They are made of ivory tusks or of buffalo horns. They are, of course, very primitive and serve for decoration only.

The Eskimos carve their artificial teeth themselves. I read once of a man by the name of Low who bought from an entirely uncivilized Eskimo a prosthesis which he had made himself. It consisted of four incisors which were carved in one piece of a walrus tusk. The incisors ended in a common bases which fittingly adhered to the gums and had on each side a hole. These holes were laid around both canine teeth and the prosthesis thus kept in place.

PART IV

THE ARTIFICIAL DEFORMATION OF THE TEETH

CHAPTER XXI

THE DEFORMATIONS OF THE TEETH—GENERAL INTRODUCTION

All over the earth, both in civilized and uncivilized countries, it is so common for people to alter the original length of their hair and of their finger and toe nails that individuals who do not submit to the general fashions of barbering, shaving, manicuring and pedicuring are, as a rule not unjustly, regarded as odd or peculiar personalities. The all-governing fashion peremptorily calls for blind subjection. The modern woman who has her hair bobbed—some twenty years ago it would have seemed ridiculous and impossible to her—pities the orthodox Jewess in Russia or Poland who on her wedding day is supposed to sacrifice the splendor of her braids to a pair of cruel scissors, the unconscious executors of a centuries-old traditional rite. Unnatural appears to us the painful deformation of the feet of the young Chinese girls, who see in this torture a very imperative, unavoidable tribute that must needs be paid to fashion. Similarly, the skull mutilations as practiced among the ancient Celts and their descendants and among the Peruvian Indians, the widespread custom of circumcision, the infibulation, the perforation and artificial prolongation of ears, lips, nostrils and nasal septum for decorative purposes, and other more or less violent changes in the original formation of the body, in those countries where they are performed are considered as natural, useful, and even religious procedures, whereas to us they appear unnatural, useless, and tasteless. Even in the civilized world to-day painting and tattooing of the skin is not at all uncommon among the lower class of the population, especially among mariners and miners.

Wherever human beings live together, there is a very strong desire to adorn the body, to excel the others through perceptible attributes, to attract the opposite sex by means of visible differentiation from the possible rivals. Among our race and in our time, the clothes and the various forms of jewelry are fully capable of guaranteeing the satisfaction of this desire. This is, indeed, one of the reasons for the tattooing of the poor laborers whose means do not permit them to take particular pride in their dressing; the etchings on their bare arms and breasts take the place of the golden watch chain, the modish necktie, or the costly finger ring.

The savage peoples, who wear very little or no clothes, are therefore referred to their own bodies for the purpose of self-decoration. They "doll up" by mutilating one or the other of the external organs by "embellishing" and "correcting" Nature, by patiently suffering unbearable pain in order to increase their beauty. We are reminded of how near we proud masters of civilization approach the cultural stage of the wild negro tribes of Africa and Australia, if we have seen our own fair sisters force themselves into the deforming cage bars of a never-tight-enough corset; if we admire the beauty of a wee tiny girl's foot which, hidden to the eyes of the admirers, is covered with aching corns, the result of the pressure of a tight shoe; if we hear of the thoughtful mothers who bore a hole through their darling daughter's ear lobe and stick a ring through it. The bearer of the earring, for her part, speaks with utter disdain of the black girl who does the very same thing to her lips instead of to her ears.

It is not in the least surprising that the *teeth* are the most frequently and the most variously mutilated organs of the body. Among the Caucasian nations, where their whiteness does not contrast so much with the light color of the skin, deformation of the teeth is very rarely met with. In the colored races, however, next the sclera of the eye, the snow-white teeth most forcibly attract the invol-

untary attention of the onlooker, the least change in their shape and in their color, every gap resulting from the lack of teeth must be noticed immediately as soon as their possessor opens his (or her) mouth to speak, to laugh, or to eat. Hence, artificial changes of the teeth are found in one or the other form, or in several variations among the same race, in the black, the yellow, and the red peoples. In those rare cases of dental deformation which occur in the Aryan and Semitic countries, they are mostly intended as a legal execution, as a punishment for some crime.

Of the numerous contributions to the literature of the mutilations of the teeth, the most valuable are the studies of Ihering, Uhle (Malays), Lasch, Lignitz, Hamy (Mexicans), Saville (Ecuador Indians), Faidherbe (Senegalese). The books of Rüdinger on the voluntary malformation of the human body, and especially of Ploss on the child in the manners and customs of the nations, also contain comprehensive compilations of the superstitions and beliefs centered upon the deformation of the teeth. The best classification of the various forms of this folkloristic "dental surgery" was given by Schröder in his excellent monograph on the artificial deformation of the teeth. He distinguishes *seven groups:*

1. Simple pointing of the teeth.
2. Filing of the teeth, forming gaps and prongs.
3. Removing the teeth.
4. Horizontal filing of the teeth or amputation of the crown.
5. Dyeing the teeth.
6. Adorning the teeth with metal and stone inlays.
7. Changing the position of the teeth.

As to the *geographic distribution* of the deformations, the Hottentots and the Bushmen do not work on their teeth at all, and the custom is also practically unknown to the members of the great Mediterranean Race, comprising Indo-Europeans, Semites, and Hamites. It must be admitted, however, that those Hamitic tribes who live in close contact with the Sudan negroes have learned from

their neighbors to deform their teeth, while those not subject to foreign influences, that is the great majority, do not submit to the fashion of dental mutilation which is found among the Wapokomo near the equator, the Wafiomi, the Wakidi, Mangati, Wandorobo, and Wakwafi (British East Africa), and also among the Bisharin. These latter, of course, have no relation whatsoever to the Sudanese.

More or less common are the deformations of the teeth among all the other races: the Australians, the Papuans, the large group of the Mongoloid peoples, including the Malays, the American Indians, and the Mongolians, the Dravida, and the Negroes. While the Malays, especially those living in Asia, freely mutilate their teeth, the custom is not very popular among the Mongolians of the Asiatic continent. It is practiced by the Bahnars and Cedans of Indo-China, by the Miao-tse in Central China, by the inhabitants of Burma, Tonkin, and Siam, and by the Japanese women. Schröder thinks that those people who were found deforming their teeth in Siam and Tonkin may not be the real Siamese and Tonkinese, but Malays who lived in those countries, yet it is also possible that the custom which had originated among the Malays had later extended to the Mongolian tribes. He also tries to explain the fact that deformations are met with among the Dravida, though to a very limited extent, by the assumption that there might have been a prehistoric Malayan immigration to Eastern India and that the Dravida are the descendants of those immigrants who still retain some of their original Malayan customs and manners.

With the exception of the Tlingits in southeastern Alaska, the natives of North America do not mutilate their teeth. In Central America, the Zapotecs, the Aztec and Tlaxcala tribes of the Nahua group, and the Huaxtecans of the Maya stock in former times have known and exercised the custom. Of the South American Indians, in their geographic order

from the North to the South, the Goajiro (Arawak stock), the Kumanagoto (Carib stock), the Chibcha (especially the tribe of the Guaymi in southern Panama and in Colombia), the Manta, Guankavilka (Huancahuillca), Choco, the Peruvian tribes, the Guatos, the Miranya of the Tupi stock, the Atacamenos in southern Peru, and the Fuegians are recorded as teeth-deforming peoples.

The classic habitat of the dental mutilations is the African continent. Although there exist a number of negro tribes who do not operate upon their teeth in order to embellish themselves, we may say that both Sudanese and Bantu negroes, the two huge linguistic stocks of the native Africans, practice the custom to a very great extent. The only exception to this rule is the southern Bantu tribes, to whom artificial changes of the teeth are not so very familiar.

In what way and to what extent the single nations deform their teeth will be shown in detailed description in the following chapters.

CHAPTER XXII

THE NON-THERAPEUTIC REMOVAL OF TEETH

THE knocking out or the extraction of teeth, though very painful and the crudest form of dental mutilation, is one of the commonest varieties of the custom and, moreover, one of the most frequently met with of all body-deforming practices. As a means of self-decoration or as a tribal distinctive mark, it is carried out by the African negroes and by the Australians, while the eastern Polynesians perform the operation as a sign of mourning. It is also exercised by the Asiatic Malays on the Indo-Chinese continent and, in former times, was common among several tribes of the American Indians.

The members of the *Caucasian race* never knew of the non-therapeutic removal of the teeth in the folkloristic sense of the custom. But we read of many instances where, in European countries and among the Semitic and Hamitic nations, teeth were removed for other than medical purposes in order to be freed from military service and as a form of punishment.

As regards the first purpose, Schröder writes: "Also in civilized countries this form of artificial deformation of the teeth was practiced; but not with the intention of pleasing the gods, but in order to sneak away from the military service. In France there occurred on account of the military service many such frauds, which have disappeared since the modification of the firearm regulations. To be freed from the service, the frontal teeth were removed, for before the introduction of the percussion gun the soldiers

had to bite off the cartridges with their teeth, and the army instructions of 1862 declared unfitness for service in the case of 'loss or caries of the four incisors of either jaw, of loss or caries of the four canines, or of at least five incisors plus canines of both jaws.' "

Extraction of teeth as a form of punishment has been recorded from the old Babylonians and Hebrews, from the Egyptians, the Hindus, from medieval Germany, England and other European countries.

The code of edicts of King Hammurabi of Babylonia (about 2200 B.C.), discovered in 1902, contains 282 paragraphs, two of which deal with the teeth. Paragraph 200 reads as follows: "If a person knocks out the teeth of an equal, his teeth shall be knocked out." But paragraph 201 says, "If he knocks out the teeth of a freed slave, he shall pay one-third of a mine." Here, and in the Biblical law, "eye for eye, tooth for tooth" (Exodus 21, 24), teeth were knocked out as a punishment for the very same delict. According to modern expounders of the Bible, this phrase is not to be taken literally; the principle of retaliation (lex talionis), according to them, was not known to the ancient Hebrews.

Among the pre-Christian Egyptians, the extraction of teeth was one of the most disgraceful and degrading forms of punishment.

In Mahabharata we read that the Indian god Siva, the Destroyer of Life, in his wrath broke Pushan's teeth, but later when appeased gave them back to him; Pushan was supposed to represent the sun.

In Bastar, a native state in the Central Provinces of India, if a man is adjudged guilty of witchcraft, his front teeth are knocked out. In Chatisghar, the southeastern division of the Central Provinces, a witch has her hair shaved with a blunt knife and her two front teeth are removed.

The slaves in Rome occasionally received blows severe

enough to make their teeth fall out. Martial (14, 68) refers to this form of punishment.

In Wieland's "Oberon," Sir Huon of Bordeaux, who by mischance has killed Charlot, the beloved son of Charlemagne, receives from the king the difficult task, if he wanted to obtain expiation and forgiveness, to make a pilgrimage to the Orient and, arriving in Babylon, to ask the mighty caliph for four of his molars and a handful of his gray beard. With the help of the fairy king Oberon and after many fantastic adventures, he succeeds in fulfilling the strange desire and thus restores his former nobility and wealth. In this story the rivalry between the Christian and the Mohammedan world, between Occident and Orient, finds its expression in the humiliation of the caliph, who sends four of his teeth as a sign of subjection to the ruler of the Franks. It is particularly interesting to learn that after Kaiser Otto's celebrated and romantic visit to Charlemagne's tomb in the year 1000, Count Otto de Comello, one of the eye witnesses, reported that he saw the Emperor take out one tooth from his dead ancestor's mouth.

In 1211 the memorable expedient of drawing a tooth daily from a Jew at Bristol until he paid down ten thousand marks is recorded in connection with the expedition of King John into Ireland. When, after seven days, the sufferer gave in, John jestingly observed: "A Jew's eye may be a quick ransom, but Jew's teeth give the richer harvest."

The extraction of teeth was also sometimes inflicted as a punishment in the Middle Ages for having eaten flesh during Lent, on those guilty of felony, or on those persons who were not willing to pay the tribute due their sovereigns. In the martyrdom of St. Apollonia, too, the removal of the teeth plays a prominent rôle, and it is this legend which later made her the patron saint of dentistry.

"Enen dör de Tänen bernen" (to burn one through the teeth), was in medieval Bremen a punishment for thieves.

The proverbial expression, "to pull one's teeth," meaning

to render harmless, to disarm by some cunning or subterfuge, has its origin in the fable of the Lion in Love (told by Æsop), who consented to have his teeth drawn and claws out in order that a fair damsel might marry him. When the teeth were drawn and claws cut off, the father of the maid fell on the lion and slew him.

A charming anecdote may be mentioned with reference to this phrase: Soon after the celebrated coalition between Fox and Lord North, the former was boasting at Brooks's clubhouse of the advantageous peace he had ratified with France, adding that he had at length prevailed on the court of Versailles to relinquish all pretensions to the gum trade in favor of Great Britain. Selwyn, who was present, and to all appearance asleep in his chair, immediately exclaimed, "That, Charles, I am not at all surprised at; for, having permitted the French to draw your teeth, they would indeed be fools to quarrel with you about your gums."

In all cases mentioned above, the removal of teeth only represents a single out-of-the-ordinary curious fact rather than a regular folkloristic custom. In passing over to the loss of teeth which is customary or even legally prescribed to all or a certain part of the members of a tribe, either men or women or both, either as a puberty rite or as a sign of mourning or as a mark of distinction, we make the observation that it is always the frontal teeth, upper or lower, one or several, incisors or canines, which are pulled out. The gap that remains in the place of the extracted tooth is supposed to be seen, for which reason the bicuspids and molars are exempt from the artificial deformations in general and from the non-therapeutic removal in particular.

To begin with the group of the *Mongoloid nations,* the custom was practiced in former centuries by the American Indians and is still in use among the Polynesian and the Asiatic Malays.

Of the Red Race, only a few South American tribes are recorded as removing their teeth: the Guaymi, some nations

of the Ecuadorean coast, the Guankavilka and the Fuegians. Among the Guankavilka (Huancahuillca), knocking out the teeth is said to have been introduced by one of the last native rulers of Peru, Huaina Khapach, as a punishment for their betraying the army of the Inca. Of the Fuegians, Ratzel says: "Men and women adorn themselves with mussel shells and dentalia—in the men regularly one tooth is missing."

The Polynesian Malays break out a tooth if some member of the family dies. The natives of the Hawaiian Islands, in the case of death, broke out one of their frontal teeth with a stone, so that older people, in whose families several members have died, have lost all of their incisors and canines. According to Linderer, they also sacrificed their frontal teeth to their god Eatoa, thus proving to him their utmost awe. In Hawaii, the signs of mourning consisted in lamenting and weeping, severe violations of the skin, knocking out of the frontal teeth and slitting the ear lobes, also in a particular kind of tattooing the tongue. During the past century this custom seems to have entirely disappeared from these Islands.

The custom of removing teeth as a sign of mourning is also met with in the Marquesas Islands, on the Tongarewa or Penrhyn Island, and among the population of the Manihiki group.

Of the Asiatic Malays, the custom is practiced by the nubile girls of the Tonapo, Tobado, and Tokulabi in Central Celebes, who have their two upper central incisors removed. Also the native girls of Formosa, at the age of puberty, lose their two upper central incisors "so that they can breathe better and more wind can enter their bodies." Boys, too, have to undergo the same operation at the same age. According to Ploss, the Pepos of Formosa knock out their children's canine teeth as soon as they have come through.

The Tajakilao, "the teeth-removing Kilao," who live in

the eastern part of Kweichow, take their girls, on the wedding day, out of the house and break out two of their incisors. They call this act "damaging the husband's house."

We see that among the Asiatic Malayans the habit of removing teeth is more common in women than in men. The same seems to be the case among the *Australian Papuans.* According to Eckhart, the natives of the New Hebrides have the strange fashion of knocking out the front teeth of the upper row of the engaged or married women. They hold a stick against the teeth and hammer it vigorously with a stone. The same custom is found among the women of Saint Philip's Bay in New Holland.

Among the *Australian race,* the act of removing teeth is very old and is, as a rule, practiced as a puberty rite, and is considered a religious ceremony. The extinct natives of New South Wales and of the Island of Tasmania used to knock out one or more of their incisors.

Of the contemporary Australians, Semon says: "A carefully arranged ceremonial accompanies the transition from one age to the other. Particularly is this true of the initiation of the adolescent lads; the declaration of their puberty in almost all tribes forms an important celebration. The inaugurated are subject to various tests and even tortures. In a few tribes, at that time, circumcision is employed, in others tattooing; many others break out one or two front teeth of the young man."

Similarly, Ratzel writes: "A deep insight into the Australian folk-soul is given by a number of consecrations accompanying the transition of boys and girls into the age of puberty; combined with this is usually a sacrifice of a part of their own body, either the teeth, which are knocked out, or the fingers, which are cut off. Pains from blows, tattooing, hunger and compulsory isolation are added. All this is traced back to divine command. Besides, in memory

of certain happenings, the teeth of the women are knocked out or their fingers are amputated."

The boys of the Goulburn tribe have to stay in the forest for two days and a night, and during this time have to knock out their own upper front teeth and to bring them to their mothers. The mother then hides the two teeth in the branches of a young rubber tree. If the son happens to die, the bark at the bottom of the tree is peeled and burned, and the remaining stump is considered as a monument to the deceased.

Spencer and Gillen report that among the Kaitish in Central Australia the removal of the teeth takes place between the tenth and thirtieth years of age, and that at the present time the natives do it for decorative purposes. The operation on men may be performed either by an older man or by a woman; girls are usually worked upon only by a member of their own sex. The operator may or may not be related to the victim. Etiquette demands that men should not watch the removal of the teeth of one of the opposite sex, and therefore it is carried out at some distance from the village or camp. The authors saw one girl who, immediately after the act, danced with the operator in a circle and then threw the removed tooth as far as she could in the direction of the Alcheringa camp of her mother.

There is a myth that in the beginning (Alcheringa) two serpent brothers knocked out each other's teeth, and that this was the origin of the custom. Spencer and Gillen also observed that two men operated upon were not allowed to watch each other; as soon as one had been operated upon he withdrew into the bush; both, as the girl did, threw their teeth in the direction of the Alcheringa camp of their mothers. This camp is the region where in mystic olden times the heroes lived who are, again and again, reincarnated in the mothers of the Kaitish children.

The Gringai of southeast Australia and the Kamilaroi of New South Wales knock out their children's teeth at the

time of puberty. The removed teeth are given to the mother of the boy operated upon.

The Warramunga in North Australia perform the operation near a pond at the end of the rain season if they want to have sufficient moisture and good weather. One or two front teeth are knocked out, the girls being subject to the act more frequently than the boys. At some distance from the place where the removal occurs, members of the tribe prepare for a sacred ceremonial, which is supposed to be unseen by the women and the inaugurated children. When the women and the children arrive at the pond, two or three fires are kindled, and their girls go, before they lie down for the operation, into the water up to their breasts, drink some of it, and squirt a part in all directions and also throw some water upon themselves, especially upon the tops of their heads. The extracted teeth are ground and put in a piece of meat which is eaten by the mother. Men have to undergo the same ceremony, but their pulverized teeth are supposed to be swallowed by the future or actual mother-in-law.

The Tjingilli (Chingilli), too, wait with the performance of the rite until the termination of the rain reason. They throw the extracted teeth into a water hole and expect that it will banish rain and clouds. The members of the Gnanji tribe, who have their initiation ceremonies at the same time of the year, have the operator carry the extracted tooth for some time with him; then he gives it to the mother of the young man or of the girl, who offers him certain foods and some red ocher for his services. She buries the tooth near a pool in order to make the rain stop and more water-lilies grow in the pool.

In Victoria, South Australia, according to Ploss, the front teeth of the boys were knocked out in their seventh year.

Among the Macquarie tribes all young men undergo the knocking out of the upper right central incisor. Only the

tribe of the Camaragals has the right to perform the act with all the accompanying ceremonies, and in each case they receive as remuneration the removed teeth of the young men. It is believed there that one of their bad demons in the shape of a horse is kept from devouring the natives only if he sees that one of their teeth is missing. They call the ceremony "kebarrah." Before the day of the inuguration all current hostilities between the single tribes are called off. All related tribes gather on a summer morning on the Macquarie Hills. Those who were chosen to begin the ceremony open it with a long-drawn cry, which is repeated in the forests and answered by the other tribes of the vicinity. Now the women and children retire into the valleys. The old men sit down to hold a conference, and the young men fell trees in order to create a free space. Then the whole tribe forms a circle; the wahui, a weapon, is brandished; their hissing and whizzing may be heard far off, and large fires are lighted.

Usually five to six hundred natives are present at these occasions; they have painted their naked bodies with clay, their heads are covered copiously with the down of the white swan. An old man walks to a tree and, making the maddest grimaces, whirls his wahui about his head. Now the young lads are led into the circle by their fathers or nearest relatives, and the kebarrah song begins, through which the candidates are informed about the tortures which they have to undergo. Then they proceed to the removal of the front tooth. A hole is made in a tree, in this a staff of hard wood is fastened. The tooth is brought in contact with the free end of the staff; one person holds the head of the victim in the proper position, whereupon another man pushes the head from behind forward. The force with which this is done suffices to remove the tooth with a part of the adherent gums. A few men standing near threaten to kill the boy instantly if he should reveal his pain, while others cut with sharp stones long stripes upon his shoulders.

In case the boy gives vent to his suffering, the operators announce with loud voices that the unfortunate is not worthy to mingle with the men of the tribe, and the women deride him as one of their kind. But if the youth silently endures the torture he enters the order of the hunters and warriors; he is surrounded by the others and handed the mundi, a small piece of crystalloid substance which is always hidden before the women. Then all the members of the tribe greet him, and he receives a shield and weapons.

On the southeastern coast, near Port Jackson, all the boys who had not undergone the kebarrah ceremony were called about the end of February to a place which had the name of "Joolang" and which had been prepared for this very purpose. There the native tribes were assembled, painted and covered with feathers and jewelry, armed with maces and spears. Before the ceremony the people danced each night. The operation was performed by members of the tribe of the Cameragals, their priests, or koradjus, being the chief operators. On one side of the place the candidates and their friends were placed; on the other side there was the rest of the crowd, who opened the festival with singing, crying, making all kinds of noises with their shields, and stamping the earth with their feet; then the whole band advanced toward the boys. When they had approached them near enough, one of the men suddenly rushed forth, seized one boy and returned to his group. There they received the boy with a cry, surrounded him and held their spears over him so he could not escape.

After having captured about fifteen of the victims, they seated them at the periphery of the joolang. Each boy supported his head with his hands and sat there with his legs crossed. Then the koradjus began their mysterious performances. One of them threw himself down to the ground and fell in a state of apparent unconsciousness. While his colleagues danced and sang around him and hit

him with sticks, he rid himself of a bone which was supposed to play a rôle in the later course of the initiation. As soon as he arose, bathed in perspiration, another priest fell down, producing another bone, and this was repeated until there were as many bones as there were boys who wanted to be received among the men. Early the next morning the keradjus ran two or three times around the joolang. Then the boys were brought, seated on the ground, and the priests crawled around them, like dogs, on their hands and feet, throwing sand upon the boys with their feet. This ceremony was supposed to bestow upon the candidates the good qualities of the dogs.

The next scene was played by a strong native, who carried on his shoulders the image of a kangaroo made of grass, followed by another with a bundle of brushwood. Both danced while the whole troop sang and beat time, and finally the bundle was deposited at the boy's feet. It was to represent the kangaroo's nest, and both the grass figure and the bundle intimated that the candidates might be able to kill these animals. A theatrical kangaroo chase, too, was performed, in that a few men held long grass in the form of tails near their buttocks, thus representing the kangaroos, and were hunted by two other armed men. Suddenly each of those men seized one boy, heaved him upon his shoulders, carried him about triumphantly, and other men took other boys upon their shoulders, making wild grimaces. Others lay down and had the boys placed upon their bodies.

Then the real operation began. The bones, which were "produced" by the priests the day before and which were pointed on the end, were used to cut the gums so that the tooth could be more easily extracted. A stick of from eight to ten inches in length and a stone served as instruments. After the operation the boy was brought back to his friends, who put on him the insignia of his new rank. He received a belt about his abdomen and a wooden sword, his head was decorated with a ribbon adorned with leaves

of the grass tree. His left hand was held before his mouth, for he was not allowed to speak nor to eat that day. The blood from the wounded gums was not wiped off; it ran down on the patient's breast and the head of the man on whose shoulders he sat; here it had to dry and to remain. The boys from then were called "kebarrah," a word derived from "keba," that is, rock or stone.

Widespread is the custom of removing teeth also in *Africa,* where principally the Nilotic tribes, those around the Chad, the Nigritians in the formerly German East Africa and in the region of the Kongo and Zambezi Rivers submit to the operation.

Of the Sudanese peoples, the Ashanti break out the teeth of their war prisoners who are rendered slaves and wear them as trophies. There, too, it is regarded as a sign of subjection to have the frontal teeth removed.

From the hinterland of Kamerun the Bali are recorded as a teeth-removing tribe, of the nations living in the environs of Lake Chad, the Somrao extract one, the Sara two, and the Bai all four upper incisors. The Tommok, the Daza, Tibu, Baele, and the inhabitants of Borgu (Borku) have also accepted the custom. In Togoland the two lower central incisors are removed.

Among the Nilotic tribes, where the artificial removal of teeth is very common, as a rule the four lower incisors are broken out. This is the case among the Bongo, the Nuer and the Dinka, the Mitti, and Madi, the Dinkaui and Jabilaui, the Shilluk, Shuli, Luri, Wassogo, Sheffalu, the Alur, Bari, Abukuja, Mundu, the Basongo, Kietz, Makraka, Moru, Sir, Mandari, Eliab, Bor and Tuids. The Tura and Latooka remove either four or two lower teeth, and the women of Okeba knock out both the upper and lower incisors.

When Sir S. Baker was visiting the Latooka, their chief told him that Lady Baker "would be much improved if she would extract her four front teeth from the lower

jaw and wear the long-pointed, polished crystal in her lips."

The Alur pretend that in their tribe the custom of removing teeth is not older than sixty years. In much the same way as the Malays of Central Celebes, they explain the act by the story that a woman got angry and bit her husband and, since then, in order to prevent similar injuries, the removal of the front teeth became customary first for their women and then for the men, too. The operation is carried out when the children have reached the age of ten to twelve years. It is not accompanied by any ceremonial or festival. By means of an old shovel driven between the canine tooth and the lateral incisor of the lower jaw, the latter tooth is loosened by levering movements and taken out. The central incisors then offer very little resistance to being removed. A sharp salt solution of vegetable ashes serves to check the bleeding, and in a very few days the wound has cicatrized. Occasionally very severe hemorrhages occur.

According to Ploss, the Shilluk also remove one upper tooth of their children, both male and female, at the age of puberty.

Of the Bongo, Schweinfurth says: "Common to both sexes is the bad habit, used by the majority of the inhabitants of Bahr-el-Ghazal basin, of knocking out the lower incisors, which operation is usually performed after the complete termination of dentition. Only in the southern part of the country bordering on the Niam-Niam, to whom the custom is not at all familiar, the mutilation is not practiced." The Bongo seem to value the deformity very highly, for almost all the skulls of the tribe that Schröder had a chance to see showed a large and very characteristic gap in the mandible.

The Dinka, according to Marno, break out the four lower permanent incisors, but according to Casati they remove only two teeth. Schweinfurth, again, speaks of all incisors.

Virchow examined a number of Dinka who happened to be in Berlin and found the following conditions:

(1) In a number of individuals the four lower incisors and the two canine teeth had been broken out. As a result of the loss, in one case the two central upper incisors were markedly prominent and on each side between the central upper incisors a strongly marked trench had developed. In one Fashoda woman the left upper incisors had assumed a slanting position.

(2) In three individuals four incisors below, two above had been broken out.

(3) In a few other cases the four upper incisors were missing.

(4) One boy had lost the left lower canine.

(5) In seven individuals all teeth were present; two of them had the incisors filed.

We see from these reports that there is no very strict rule among the Dinka as to which teeth should be removed.

The tribe of the Masai practices the removal of one or two teeth. Of seventeen Masai who were present at the Colonial Exhibition at Berlin in 1896, fourteen had some of their incisors, mostly the two central ones, missing. Both boys and girls undergo the operation, which is carried out with a knife. In a great number of cases the victims have to endure the act twice, for not only the permanent but also the deciduous teeth are extracted. Weiss believes that the custom originated in an old religious rite, the meaning of which, however, he could not obtain from the natives. They said their purpose in doing this was to obtain a gap between the teeth wide enough to allow them to spit in a long jet after the drinking of beer or milk.

Of the Niloto-Hamitic tribes, the Wakidi remove one lower incisor, the Wafiomi two. The Mangati and the Bishari (in Abyssinia) observe the same custom.

A great number of the eastern Bantu tribes must be mentioned as removing their teeth.

The Wanyoro and the Wawitu break out the four lower incisors; the tribes of the Kilimanjaro valley, the Wasambara, some peoples in Iramba, Umbugwe and Irangi remove only the two central front teeth. So do also the Wakaguru, the Wagogo, and the Wanituru, where both sexes undergo the operation, the Buma, the Wanyamwezi, the Wadjagga and the Wafiya.

According to Charles Darwin, the Batoka knock out the two upper incisors (Schröder speaks of four) which, as Livingstone remarks, gives the face a hideous appearance, owing to the prominence of the lower jaw; but these people think the presence of the incisors most unsightly and, on beholding some Europeans, cried out, "Look at the great teeth!" The chief Sebituani tried in vain to alter this fashion. Schweinfurth sees in this particular type of dental mutilation an imitation of the "worshiped" ruminants.

Holub writes of the Barotse, "In the Marutseland I heard nothing of the circumcision so common among the Bechuans and so odious to the Zulu race; yet methods of hardening were described to me which, mostly varying in the single tribes, give the pubescent lads the right to call themselves men, and which are supposed to be useful to them in life or to make them known. In the latter case certain ceremonies are traditional. We had the opportunity to observe them in the Matonga, in a few Makalaka tribes of the land. Young Matongas who have reached their sixteenth year retire for a few weeks in the deeper, lonelier forest regions. They are accompanied by several men who, after various procedures, break out the upper middle incisors with a poleax. To the wound warm pap is applied in order to check the bleeding, the pain and the inflammation. The Mashukulumbe extract all upper front teeth, which results in a sinking in of the upper lip. After this test of the manly constancy, each boy is considered as a 'man' and is allowed to woo. I was even told that the women are quite

responsible for this operation. They say that men who eat with all their teeth are like the horses and that they would not have horses for husbands."

The East African Kikuyu, if questioned why they remove one of the lower incisors of their children, say they do it in order to let water enter the mouth through the gap in cases of emergency. There is a disease among them, they say, which presses the two jaws tight together so that the mouth cannot be opened to take in the food. The removal of a tooth is therefore practiced as a prophylactic measure. The Kikuyu call the operation "wehe." The custom is common, although its observation is not prescribed by the law or by the religion. Only the mother or her representative is allowed to perform the act, and it should be carried out only in the time between the awaking of the child's intellect and the circumcision at the time of puberty. If it has not been done at that time it should by no means be done after the circumcision has taken place.

Schröder mentions further the Apono in equatorial Africa, who extract the upper central incisors, and the Muserongo, who remove all four upper front teeth.

The Batonga remove, besides the upper incisors, also the eyeteeth. They trace the custom back to the time before their country was in British possession and when they were dragged into slavery by the Metabele, Barotse and their other enemies. They removed their six upper front teeth then so that they might know each other by the gaps.

Of the western Bantu, the Bakuba knock out the two upper central incisors of their boys and girls with two wooden clappers. So do the Bodinga, the Bassongo and the Bashilele. The inhabitants of Kalunda very seldom mutilate their bodies; if they do, they perforate their ear lobes or knock out their lower front teeth. The Molua in the empire of the Muata Yamwo, according to Pogge, remove two lower incisors. The women of the Gager, a nomadic

tribe in Benguela, have to break out two upper and two lower front teeth if they want to please their husbands or their lovers.

Only very few tribes of the southern Bantus practice the custom of body mutilation. The removal of teeth has been recorded from the Bechuans, the Ovambo, the Ovaherero and the Damara.

The Herero considered only those as full members of their tribe who had undergone the dental mutilation. They alone were permitted to drink from the sacred calabash. The operation is still accompanied by a number of religious ceremonies, although it is now looked upon as a tribal distinction mark rather than a pious sacrifice. It used to be carried out in the morning at five or six o'clock, and it was a strict rule that the children must not take any nourishment on that day. The blood was checked with a piece of meat heated at the sacred fire (okuro), which was lighted at the place where the ceremony was performed. The act was followed by a festival of several days' duration, consisting of dances, songs and feasting. The fathers of the children operated upon furnished the meat and the milk.

The Herero women thought the deformation so beautiful that the missionaries had no success with the prohibition of removing teeth. It is also remarkable that those who forsook the Christian religion after they had accepted it immediately had their teeth knocked out.

CHAPTER XXIII

THE SIMPLE POINTING OF TEETH

The commonest and most widely distributed form of dental mutilation is the simple pointing of the front teeth. The upper incisors are most frequently submitted to this operation, in a small minority of cases the upper canines are included, and occasionally we find that both upper and lower front teeth may be filed to form sharp points. It is only in a few very exceptional instances that the lower teeth alone are made the victims of this very painful procedure, which is usually performed at the time of puberty or as a nuptial or prenuptial ceremony in members of both sexes. Various instruments are used for the operation, depending chiefly on the cultural stage of the nation or tribe in question. Where there is but a very low level of civilization, the teeth are pointed with stone tools, others use sandstone or pieces of quartz, in very many cases the armamentarium consists of a knife-blade or a hammer; the most modern instrument is the file in those regions where the inhabitants have come into contact with Europeans, since only very few of the primitive peoples are acquainted with the method of producing satisfactory files.

Unfortunately very rarely the explorers and observers thought of asking the natives why they sharpen their teeth to points. It must be more than interesting to learn of the reasons which those people have in mind when they submit to a painful torture like this. According to the notes which I could find, mentioning something about the statements of the aborigines regarding the custom, there are four different factors that are considered in various regions. The Niam-

Niams, cannibals of Central Africa, thus wish to increase the efficiency of their teeth as natural weapons; with their pointed teeth they can much better pierce their enemies' flesh in a fight than they would be able to do with their teeth unaltered. Others think it beautiful to have their dental organs look like those of certain animals. The warriors of Kroe, Benkulen (in Sumatra), desire to have them "sepih karan," as sharp as those of a mouse. The Sibnowans of Northern Borneo make them "as sharp as shark's teeth." The Indians of Yucatan, in the sixteenth century, filed their teeth to points to make them look like sawfish's teeth, which they thought were very beautiful. The Central African Wawira, among whom only the men deform their teeth, point their dental organs for æsthetic reasons exclusively; a man who did not participate in the general fashion would not find a girl in the entire tribe who would want to be married to him. The Manganja women, near Lake Chilwa, have their teeth pointed so that when they laugh their large mouths might resemble those of beasts of prey. The Wagueno, too, by doing so, wish to obtain the expression of rapacious animals. The pointing of teeth is a mark of tribal distinction of the Bassongo-Mino of Central Africa. "Bassongo," in the language of the natives, means "men," "mino" means "teeth," the name of the tribe thus indicates that they are men who have something the matter with their teeth and refers undoubtedly to their custom of filing their teeth to sharp points. Similarly, the group of Wahoko peoples, the Wahoko, Wakuma and Walengola, further the Wawira, Wandedodo, Wandesama, and Wakondjo, who perform the same operation on themselves, are called "Wassongora" by the inhabitants of Zanzibar, from "kussongora," the custom of pointing the teeth. In certain places the custom has gradually assumed a religious significance, and it is very characteristic that occasionally their idols, too, are represented with pointed teeth. Thus the Ethnographic Museum of

Leyden possesses an idol of Nias, a Dutch island west of Sumatra, with teeth of triangular shape. The Bali of the hinterland of Kamerun have masks, worn by the men during dances and mourning ceremonies, whose teeth are filed to points in the same fashion as are those of their wearers themselves. We also hear of Kinch ahau, the Mayan God of the Sun, who was always represented with a beard and with pointed incisors.

The extinct Tasmanians apparently did not point their teeth, nor do the inhabitants of the Australian continent. Among their next racial relatives, the Papuans, the custom is not very popular either, but was recorded by several observers. The natives of southwestern New Guinea in the region of the Wamuka river and on the Island of Waigua are the only Australian Papuans known as deforming the teeth in the described fashion. Of the Asiatic Papuans it is chiefly the Negritos of the Philippine Islands who sharpen their dental organs to points, so that the row of teeth has the appearance of a saw. They perform the operation immediately after the completion of the second dentition. The pointing is restricted to the upper incisors. It must be mentioned that the fashion is not compulsory among them and that there are quite a few Negrito families or tribes who did not acquire the custom which is practiced chiefly by those Negritos who live on the Island of Luzon.

The Bagobos, a Malayan tribe inhabiting central Mindanao, Philippine Islands, point their teeth. Of the Malay Archipelago, the fashion has been reported from Sumatra, where the Battaks file their children's teeth to points at the time of puberty, and where the natives of Benkulen (in Krœ, in Lais, the Rejangs) and the inhabitants of Lebong try to obtain the appearance of certain animals by pointing the teeth. The custom is also known to the Sibnowans of Borneo, to the inhabitants of Djapara, Java, of Mandura, north of Java, of Menado and Makassar (Celebes), and to those of the Mentavei Islands. There

has been quite a controversy among a number of authors concerning the question as to whether simple pointing is practiced among the natives of the Island of Nias. It seems as though it is obsolete there at the present time, but it must have been common on the island at an earlier period, as may be concluded from the idol with pointed teeth mentioned above.

It is beyond doubt that a number of American Indian nations used, and still use, to point their teeth. Bancroft says of the ancient Mayas: "Mayas, like most other American aborigines, deemed it essential to modify and improve their physique by artificial means. This they accomplished by head-flattening, teeth filing, etc." Among the natives of Yucatan the operation was performed by old women who filed the teeth with certain stones which they moistened with water before using them. In Panuco, in addition to pointing the teeth, holes were bored in them, which were filled with some black substance, a combination, which was also common among the Huaxtecans. A skull found on the ancient graveyard of Cerro de la Palmas in 1865, with pointed lower incisors and canines, proves that the custom was practiced by the Toltecs. Bastian describes a Mexican skull unearthed near Zempoala, capital of the ancient Totonacs, with teeth sharpened to points. According to Hamy, there are still some Aztecs of pure blood who live isolated and far from the roads used by travelers, practicing the old custom of dental deformation by pointing the teeth. The Guaymi of Panama not only extracted their teeth but also filed them to sharp points. The fashion is also known to the Indians of Pernambuco, Brazil, and Peru, and Schröder saw pointed teeth on several mulatto skulls of the museum at Göttingen; the central incisors were unaltered but the lateral incisors and the canines were very skilfully filed to points. It may be mentioned that also many negroes of South America, chiefly Brazil and Peru, point their dental organs.

The Kader are the only Dravidian tribe known as pointing the teeth. The men submit to the operation immediately after the wedding. The "patient" lies down on the floor, and the operator holds a knife-blade against the tooth and, beating it with a hammer, splits off small pieces of the upper, rarer also of the lower, incisors and canines.

The classical place of this form of dental mutilation is the African continent. It has its widest distribution in that section, which is encompassed by the Senegal and Niger rivers and the coast. Chéron says of the inhabitants of Upper Volta: *"Quelques individus se font casser en pointe les incisives et les canines. Cette opération est faite par les forgerons avec deux petites masses de fer, l'une faisant office de marteau et l'autre d'enclume."* In the regions of Sierra Leone the bride and the groom go to the blacksmith who files their teeth, whereupon the medicine man weds them. North of Sierra Leone, the custom is practiced by the colored population of Bolama, Portuguese Guinea. The Kroo, a tribe of stalwart negroes, chiefly of the Pepper Coast of Guinea, point the four incisors, both of the upper and lower jaws, so that they end in sharp points. The eyeteeth are often included in the deformation. The fashion is not practiced by all members of the tribe, and it seems as though there are various combinations and varieties in the various villages, which serve as a mark of distinction. Schröder met a Kroo negro who had the two upper central incisors filed in triangular form, the two lower were missing. The man said that this was a custom of the people of his village, while in other villages they had other forms of dental mutilation. The Bobo, Mossi and Samo also point their dental organs; so do the Ewe negroes of Togoland.

The Timmene and Bullom tribes of Sierra Leone hold a thin and flat piece of iron under the tooth to be sharpened, and with a wooden instrument beat against a sharp knife-blade upon the tooth, so that small particles of the sub-

stance come off. This is repeated several times until the tooth is very sharp.

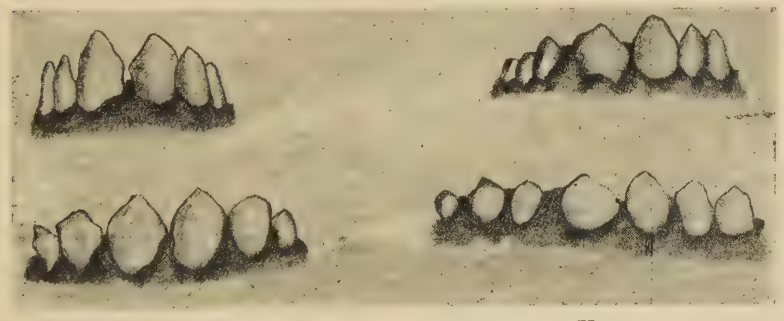
East of the Niger the fashion becomes less frequent the more we approach the Nile. Several tribes of Adamawa file the upper incisors, occasionally also the lower ones. In the region of Ngaundere both sexes sharpen their front teeth to points. Ihering tells of a tribe in the southern part of Darfur whose members file their children's teeth and also shove the gums as far back as possible to make the teeth appear longer. Shay found that all of the Madis, a Nilotic people on the Upper Nile, file their teeth to sharp points. The Niam-Niam (Asande) were already mentioned as addicted to the custom, which is further prevalent among the Banda.

All tribes named above belong to the group of Sudan negroes. The following is an enumeration of the Bantu nations practicing the custom of pointing the teeth. The Fan, a powerful group of Semi-Bantu negroes of the Kamerun and French Kongo, sharpen all, or almost all, of their front teeth to points. The Banyangs and Bayongs mutilate the upper central incisors. The Loangos, Kabindas and Mayombes on the north side of the Upper Kongo deform the same two teeth, but it may happen occasionally that they also operate on the lower incisors. The Bateke, Bayansi and Wabari of the Middle Kongo restrict the fashion to the two upper central teeth, while the Wangatta file the four upper and two lower incisors. The Okande use a knife-blade for the operation. All incisors, both upper and lower, are mutilated by the Wabonyele, Walumbi, Wanga, Wakumu, Walengole and most of the Wawira tribes. Among the latter the operation is performed as a puberty rite only on boys at the age of twelve to fourteen years, the equivalent for girls consists in piercing the upper lip in their sixth to eighth year. The Momfu, Wambuba and Walesse have adopted the custom from the Wawira. Of the nations inhabiting the regions of the Lower Kongo the Bassongo-Mino, the Batoba (upper

incisors), the Mokenge (upper and lower incisors), the Mushinshe, the Lunda negroes, the Mussangana (only women) are known as pointing the teeth.

Of the tribes living in the environs of Lake Nyassa, the Matumboka, Manganja, Amatonga and Marambo file their teeth to points. The Makonda on the Rovuma River, the Makua in Mozambique, the Wanyamwezi of Kakoma, east of Lake Tanganyika, the Barotse on the Zambezi River, the Wakamba in the region of Nairobi, the Wagogo (west of Dar-es-Salaam), the Wateita (between Lake Tanganyika and the coast), are tribes of the Eastern Bantu recorded as pointing their teeth.

It is remarkable that the custom of pointing the teeth is very rarely combined with other forms of dental mutilation.



The Pointed Teeth of the Dravidian Kader

CHAPTER XXIV

THE PRODUCTION OF DENTAL PRONGS AND NOTCHES

MANY African peoples, instead of filing or sharpening their teeth to points, notch their dental organs in such a manner that semilunar or triangular defects of the substance are produced, which give the crown the appearance of a fork with two prongs. Other tribes make an opening of a triangular shape between the front teeth, usually the two central incisors, chipping off the adjacent portions of each tooth. The notches may be made quite shallow, but in most instances the operators do not pay the least attention to the problem of preserving the integrity of the dental cavity and the pulp.

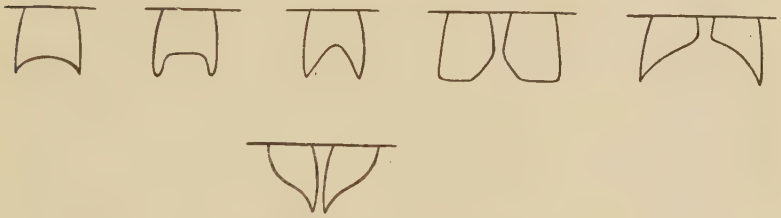
"It is surprising," says Livingstone, "that the filing and chipping which the teeth undergo, that the possessor may be in the fashions, do not produce toothache, as is the case with us when a piece is chipped off by accident. But teeth here are more solid, and often wear down to the gums in old persons without decay, like those found in Egyptian mummies. A phrase used to express a very aged person is 'that he lived so long that his gums and teeth were worn quite smooth together.' Cases of toothache are not at all uncommon nevertheless, though probably not so usually met with as among ourselves. This abuse of the fine teeth which they possess by nature is common among both sexes."

Whereas the simple pointing of teeth is very rarely combined with other forms of dental mutilation, we find that the production of prongs and notches is usually associated with the extraction of teeth. Thus in the same mouth, some

teeth are missing and others show the results of their treatment with a notching instrument, which may be a file, a piece of quartz or a knife-blade.

The habitat of the custom is the African continent.

Beginning with the South, we meet the fashion of producing a triangular gap between the two upper central incisors among the Ovaherero, who at the same time also knock out the lower front teeth. We know that the Ovaherero have practiced this custom for at least one hun-



Dental Prongs and Notches

dred and seventy-five years. It has become so deep-rooted a tradition among them that they brave all pain and gladly undergo the deforming operation, and they think that a man or a woman without such a triangular gap lacks beauty and is not at all attractive to the opposite sex. Those of the youngest generation who are under the influence of missionary work and have become Christians, usually can be persuaded to keep from mutilating their teeth, but as soon as one of them happens to return to his heathen native religion, one of the very first things he does is to have his teeth deformed in the fashion of his tribe. It is not uncommon, even, that those who remain Christians, particularly members of the fair sex, cannot resist the temptation and sooner or later appear before the missionary with the tribal dental "decoration."

The operation which consists in the removal of the four lower incisors and the production of a triangular notch between the two upper central teeth, is performed as a

puberty rite in both sexes at the age of twelve to sixteen years, after the completion of the second dentition. A larger number of children, about twenty to forty, is submitted to the operation at the same time.

In the morning of the day when the ceremony is to take place, some member of the village collects certain plants, the roots of which are ground between two stones. The powder thus obtained is moistened with water and a part of the substance dropped on the children's heads. The operator sits down on the floor and the child is placed on his knees. One of his assistants holds the youngster's hands, another his feet, and one holds a piece of wood in the victim's mouth to keep it open.

The instrument is a wooden staff of a hand's breadth and as thick as a finger and is pointed at one end to the width of a tooth. It serves as a chisel, while a simple stone is used as a hammer. At first the four lower teeth are knocked out and the wounds pressed close together and treated with a piece of a styptic bulb. The notching of the upper central incisors follows afterward and is usually not done in one session but on many successive days, the instrument being a rough stone.

The operator, any individual who knows how to handle the matter, is surnamed "omuhe," the act of producing the notch is called "okuha" in Otji-herero, "oku-kulua" in Oshidonga, and "oku-pejeka" (to make an opening) in Umbunde. The gap or notch is called "oruvara" (colored spot, also authority, or power) in Otji, "osheelo" (door) in Oshidonga, and "oshiwalakifi" (sign of the causer of death) in Oshikuanjama.

The names contain the key to the understanding of the reasons why the Hereros and other southern, western and eastern Bantu tribes mutilate their teeth. According to an old Bantu myth, death enters the human body through the teeth. The Ovambo do not notch their upper teeth, as do the Ovaherero, but the lower incisors. They give a

very interesting reason for this. "Omusisi (the personification of Death) went in through the upper notch of the Aashimba-Ovaherero, but failed to go out again, because the Aashimba (the Unlucky) have no lower notch or osheelo. Therefore the Ovambo were wiser and made the osheelo (door) below to give the enemy (death) a chance to get out of the body again. They are 'Aujamba' (the Lucky)."

A man whose teeth are not deformed, is called "omundu nonguavi" by the Ovaherero and is considered an "omuntuna," or stranger; those presenting the dental mutilation of the tribe are "omunatje," or "men of our community." In a former time, only the latter enjoyed all rights and privileges accorded to full membership or "citizenship" and were allowed to drink from the common and sacred calabash. The war prisoners, aside from being deprived of the end phalanx of one little finger or of both, are submitted to the dental mutilation of the tribe, to "brand" them as belonging to the Ovaherero.

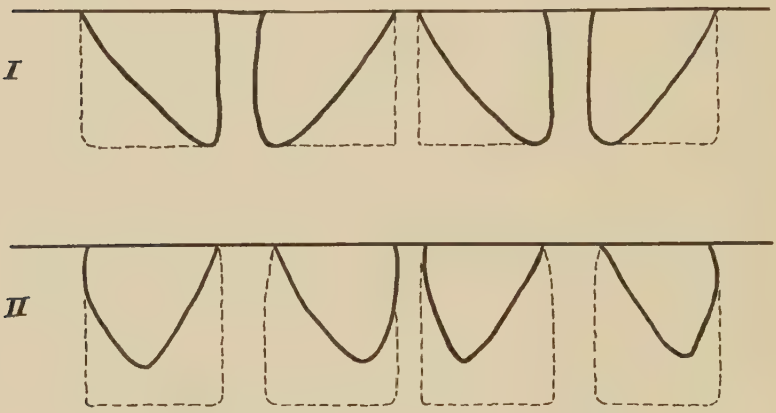
If the Ovaherero see a good-looking white girl, they would say: "This lass is beautiful; too bad, she has a mouth full of teeth!"

Of the western Bantu, it is chiefly the Loango negroes who have the fashion of producing dental notches and prongs. All upper incisors are involved in the mutilation, for which they have two patterns.

The Kongo tribes, again, usually restrict the deformation to the two upper central incisors. The Damba file them in such a manner that only the lateral edges of the crown remain. "It looks very coquettish," says Willy Wolff of them, "when the young girls laugh and push the tip of the tongue through the dental gap." The Basanshi, who live between the Kongo and Kwango rivers, also leave only the lateral portions of the two upper central teeth in the mouth. The same mode of mutilation is practiced by the Ganguellas of Portuguese Angola, where the operation is carried out

with the aid of a knife-blade, by the Ambuellas and by the Djinga negroes in the region of the Kuansa River.

A triangular notch between the two upper central incisors is produced by the following eastern Bantu tribes: Wasambara, Waseguha, Wanguru, Wassagara, Wakami, Wasaramo, Wadœ, Wassukuma, Wanyamwezi, Wanika, Wadjagga, and Manganja who, according to Livingstone,



The Mutilation Patterns of the Loango Negroes

notch each of the upper fore-teeth by means of small quartz stones.

The Wakussu and Manyema are other Bantu tribes deforming their teeth in the described manner.

Less common is the fashion among the Sudan negroes. It is chiefly the inhabitants of Togoland who produce dental notches of triangular shape. The custom was particularly reported from the villages of the Kratji and Kebuh tribes and the region of Little Popo.

In the other regions of the African continent this form of dental mutilation is rather rare. The Bongo are the only Nilotic tribe whose members notch either the two central or all four upper incisors. It is of interest that, according to Ploss, in 1909, several skulls were unearthed

near Dakka, Nubia, the owners of which had lived in the second or third century; some of their front teeth had apparently been knocked out, while others were notched after certain patterns.

The Hamito-negroid Masai and Wandorobo produce a wide triangular notch between the upper central incisors. They say that they could spit out so much better through the dental gap. The Masai spit at an individual as a sign of reverence and friendship. (This reminds one of the belief of the Galelareese, who think that when your teeth are being filed you should keep spitting on a pebble, for this establishes a homeopathic connection between you and the pebble, by virtue of which your teeth will henceforth be as hard and durable as stone).

CHAPTER XXV

THE AMPUTATION OF THE CROWN

Instead of pointing the dental organs or of producing certain patterns which result in the formation of prongs and notches, a number of primitive tribes file their teeth horizontally. This type of dental deformation either may be but faintly indicated by the removal of a very small part of the crown, or a considerable portion of the crown may be taken away; in this latter case, Schröder speaks of the "amputation of the crown." The upper four incisors are most frequently submitted to this painful operation, occasionally also the upper canines and bicuspids, rarely the lower teeth.

The custom is not quite popular in Africa. The Mushikongo of Lower Guinea file their teeth to an equal level with the gums. Both upper and lower incisors are deformed in such a manner that nothing but a very narrow and hardly visible stripe is left of the entire crown. The Wabuma, a Bantu tribe in the region of the Middle Kongo, file the upper incisors down to the gums.

The Papuan inhabitants of the islands of Amboyna, Ceram, Buru, Kei, and Arru, of New Guinea, and of Timorlaut, file the front teeth horizontally. In most cases the four upper incisors are mutilated, but as there is no special rule, often the upper canines, bicuspids, and even the molars are included, and occasionally also the lower teeth are submitted to the "embellishing" operation.

It is the Malayan race that may be considered as the real executor of the custom of amputating the dental crown. Kleiweg de Zwaan gives a very vivid description of the

operation, as performed among the inhabitants of the Island of Nias. In Lolowua, eastern part of Nias, it is carried out by the kataha, a specialist, whose sole occupation consists in the filing of teeth. For each operation he receives twenty cents and some food. The act should always take place at the time of the crescent moon, if possible, early in the morning. The natives admit that the procedure is very painful but believe that they have to undergo it, because white and not mutilated teeth make them look ugly. Some people adorn the dental stumps with small pieces of brass or gold, which, they think, look very pretty. The teeth of the boys are filed shortly after the circumcision, those of the girls at the age of about ten years. The child cowers down on the ground so that the buttocks rest upon the heels, and leans on a rice tub. The mouth is kept open by means of a piece of wood held between the teeth. Then the six lower front teeth are amputated with a small saw (famofo) in horizontal direction from the left to the right of the child. Thereupon the "patient" is laid on the back, the upper lip drawn up with a piece of cloth, and the upper front teeth amputated. The sharp edges and points are removed with a file. Then the stumps are blackened with fangito. To obtain this coloring-matter, the natives place one half of a cocoa-nut shell over a fire and cover it with the other half which has a hole in the middle, and through this hole they stick a knife. The smoke from the heated lower half escapes through the hole in the upper half, and the soot adheres to the knife. This black soot is taken off with the fingers and rubbed on the dental stumps. During the first four days after the operation the teeth are blackened each evening anew, and later from time to time on the occasion of special festivities.

In the northern part of Nias the procedure is about the same. There, the specialist, who is called dukun, must always be a man (in Lolowua a woman also may do the filing). The girls are operated upon shortly before their

wedding. The best time for the procedure are the days of the waning moon. The people believe that the filing of the teeth is apt to prevent toothache, and that a child who has his teeth filed will develop much better and quicker than one with unfiled teeth.

In southern Nias the boys' teeth are mutilated when they are able to climb up a cocoa-nut tree (about twelve years), and the girls' teeth, when they are strong enough to carry water (about eight years). Their reasons for filing the teeth are that the child will grow up sooner and that filed teeth look so much better than unfiled ones. The act is carried out in the morning, because the natives believe that the teeth are soft in the morning and become harder during the day, which would increase the difficulties of the operation. The filing should take place either on the sixth, or on the tenth, or on the twelfth day of the lunar month; if carried out on any other day, the operation would be followed by a painful and dangerous swelling. The specialist, called ere, receives for his work some red rice, a ten-cent piece and a "kundri." The latter, which is the fruit of Abrus precatorius, has a symbolical meaning. Its seeds are coral-red with the exception of one little black spot. The donation of a kundri expresses the wish that the child's mouth, after the operation, may resemble the kundri seed—coral-red gums with black teeth.

In western Nias the operation is performed by the child's father, or in the case of the father's death or debility, by the maternal uncle. After the filing, the child should not chew betel for four days.

Some people of Nias do not allow their children to eat of the meat of a pig's jaw, for if they do so, their faces will be swollen later after the filing of their teeth.

The Battaks of Sumatra file the upper incisors down to one-half their original length, the lower ones to an equal level with the gums, and occasionally also the canines. The operator uses a small iron chisel and a hammer made of

wood or bone, with which he beats off one piece after another, until the tooth has the desired length. Then the sharp edges and points are smoothed by means of a stone or a file. The children are not supposed to show any sign of suffering during this very painful operation. Among the Rejangs, too, both sexes submit to the operation. The same is also reported from the Atjinese of Sumatra.

The inhabitants of Celebes have a special legend attempting to explain why they have accepted the custom of filing the teeth. "Once upon a time there was a king who lived happily with his wife, the queen, until he met another girl who was younger and prettier than his own wife. The queen noticed to her greatest displeasure that her husband preferred the girl to herself. In her wrath she ordered her rival's teeth filed, in order to spoil her looks for lifetime. But the expected mutilation had just the opposite effect, the girl looked prettier than ever before; the king made her one of his wives and loved her more than the others, of course. Since that time it became a common custom among the people of Celebes to file their teeth."

The custom is also very popular in Borneo, particularly in the southeastern section of the island, where both the heathen and the Mohammedan inhabitants undergo the operation. The Dyaks think that white teeth, having their natural length, look like those of a dog. (In Java people whose teeth were not filed are compared with dogs or apes.) The Mohammedans say that the custom of filing the teeth had already been practiced by the Prophet. Both sexes submit to the procedure twice or three times during their lives; the first time at the age of ten to twelve years, the second and third times whenever they feel that the teeth should be shortened again. The specialists are called Paasahangigi or Tukangigi, or tooth-masters, who receive about ten to twelve cents for their work. There are two forms of dental amputation: bapapar and batatak. Bapapar is an operation performed with the aid of a stone. It

is very painful and followed by swelling of the face, and the teeth cannot be used for eight days after the operation. This mode of amputating the crown has now become obsolete. Batatak, the procedure now in fashion, is carried out with the aid of a modern, European file and causes less discomfort than bapapar. The armamentarium consists, according to Grabowsky, of a number of triangular files, kikir penatak, a thin quadrangular file, kikir pengubas, and several saws resembling notchy table knives, rgadji. These instruments are kept in a bamboo quiver which is filled with the juice of unripe pine-apples. The "patient" lies down on his back near a post of the house. A pillow, bantal, is placed under his head. A round wooden stick, about 3 cm. in thickness, called kalang, is tied to the post, so that the patient may bite on it without moving his head. The operator, after washing the instruments with cold water, cowers down to the left of the victim's head, seizes the file with his left hand, and draws with the right hand the patient's upper lip as far back as possible. Then he begins to file "as though he were working on a piece of iron and not on a human being." He constantly calls to the patient: "Kantip, kantip," which means: "Bite, bite," referring to the kalang tied to the post. After filing the teeth with the triangular file to about one-half their length, he uses the saw. Then the quadrangular file comes into action for the purpose of smoothing the sharp edges and of removing the adherent tartar from the teeth. The whole act lasts about ten minutes. The teeth involved are the upper incisors and canine teeth.

The teeth are also filed horizontally in the Islands of Flores, Madura, the Moluccas, and Sula. The Sulanese are not allowed to file the lower teeth as long as their brothers and sisters are alive. Similarly, in Kedu, only those are permitted to amputate the crowns of the lower teeth, whose parents and all brothers and sisters have died. In Benkulen,

too, only those who have no relatives may multilate their lower teeth.

If, in the Island of Timorlaut, a woman has failed to have her teeth filed, she should absolutely submit to the operation during her first pregnancy.

On the Malay Peninsula the custom is as common as on the islands. The girls are operated upon at the age of fourteen or fifteen years, one day before the payment of the dowry. White teeth give their bearer the appearance of an animal. They are, therefore, filed down to about one-fourth of their original length and blackened.

Explorers occasionally report that the teeth of many Indian tribes are worn and look as though they were amputated. But here the effect is brought about by their mode of selecting their food. Bancroft says of the Eskimos: "Their teeth are regular, but from the nature of their food, and from their practice of preparing hides by chewing, are worn down almost to the gums at an early age." Of the Haida Indians, he says: "Salmon are opened and the entrails, head and backbone removed before drying. During the process of drying sand is blown over the fish, and the teeth of the eater are often worn down by it nearly even with the gums." He also states that the teeth of the river tribes are worn down by eating sanded salmon.

The Tlinkit Indians are said to file their teeth horizontally. They, and the natives of Trinidad are the only Americans who were ever reported as amputating the dental crown. Hamy, quoting from Vancouvre, says of the latter: "*Les dents des deux sexes sont toutes limées horizontalement jusqu'au ras des gencives, les femmes exagèrent l'usage au point de les réduire au dessous du niveau.*"

CHAPTER XXVI

BLACK TEETH AND RED TEETH

"As this is a prosperous day, your daughter has decided to dye her teeth black for the first time. Hearing of this, I felt great joy. As congratulation gift I have sent you a brush, a sack full of powder and a container therefor. We have spoken it over and found that this might be the right thing. At the opportune time, I shall congratulate you personally. Please remember me to the grandparents. With best wishes, I am. . . ."

This epistle, taken from a Japanese guide for letter-writing, is to be directed to the mother of a girl who blackens her teeth for the first time. The mother, in return, thanks the writer "eternally" for her congratulation and gifts and adds this: "Out of your truthful heart you wrote many lines. Of this I am very glad. At the opportune time, I shall give you my thanks to your face."

The practice of blackening the teeth was supposed to be a symbol of the marital state; this is at least the interpretation found in so many travelers' reports and in Japanese stories. The women, it is said, mutilated their teeth before their marriage in order to look less attractive to other men and to keep the husband from being jealous. But we know that not only women used to blacken their teeth but also the men of the aristocracy and even princes. It is further a fact that this custom used to be common among the geishas, girls especially trained to furnish entertainment at convivial and social gatherings. Since the geishas were expected to be perfect beauties, it is hardly believable that they should have blackened the teeth to render themselves

less charming. The interpretation of the practice as being a marital sacrifice on the part of women is therefore nothing else but a romantic attempt to justify a custom which, after the adaptation of western civilization by the Japanese, might have begun to appear barbarous and awkward. To-day the blackening of teeth in Japan is becoming more and more obsolete.

The Japanese had several methods of staining the teeth. They used a dye that was made of a mixture of iron-filings and saki, which is a kind of whiskey. Or they prepared the coloring substance of gallnuts and iron-filings and applied the liquid to the teeth with a feather. Or they poured water over a few pieces of iron and left it there for about a week, until it had assumed a yellowish-brown color; then they poured the water in a cup and held this over the fire. As soon as the liquid began to boil, they painted the teeth with it with the aid of cotton, whereupon the mouth was rinsed with an infusion of tea. This procedure was repeated several times until the desired effect was reached. It is claimed that these dyes are very durable and do not wear off for many years.

Until very recently large quantities of black artificial porcelain teeth were exported from America to Japan, where artificial plates for men and single women were made with white teeth and those for married women with black teeth.

The custom of dyeing the teeth black or red is prevalent chiefly and almost exclusively on the coasts and islands of the Pacific and Indian Oceans.

Of the Asiatic Papuans, the natives of the Nicobar Islands, a group east of the Bay of Bengal, blacken their teeth at the age of puberty. They compare white teeth with those of a dog or a pig. A woman there would be despised by the others if she would condescend to marry a man who did not stain his teeth. The Alfurese of Ceram, too, think it very beautiful to have black teeth. The Alfurese of Buru, to make the coloring matter adhere to the

teeth, file these organs before staining them. So do also the aborigines of Amboyna and the Kei Islands.

Many of the Australian Papuans practice the custom of blackening the teeth. Sievers reports of the inhabitants of Kaiser Wilhelm's Land that they dye their beautiful white teeth black, and that only the younger girls and poor women exclude themselves from this fashion, because they cannot afford to buy the expensive coloring matter. Along the coast of German Guinea the natives use a kind of dark earth, which is mixed with the juice of the root of a nut-tree; they knead this mixture until it has assumed the form of a small miniature pillow which they apply to the teeth for several nights. This gives the teeth a deep black, shining polish. In most of the islands of the Bismarck Archipelago (New Britain) the teeth are blackened. In Neupommern, southwestern New Britain, the young men use a dark earth, consisting chiefly of the mineral marcasite (iron sulphide), to color their teeth black. The finely chewed leaf of a kind of tree is mixed with the powdered mineral, and the resulting black fluid rubbed on the teeth. This is repeated at short intervals for two or three days until the color becomes permanent. During this time they must not eat anything. This is done in the men's house and must be accompanied by proper ceremonies and "sing-sings." They say it is done to make the women like them. The custom is not practiced by the natives of the Solomon Islands. Some of the people in New Britain do not blacken all of their front teeth but alternatingly dye one and leave the next white, and so forth.

Both the Asiatic and Polynesian Malays tinge their teeth. The inhabitants of Formosa do this with the extract of some fresh herbs. The Tinguians of northwestern Luzon color the teeth by application of tan bark and iron salts. The Bontoc women of northern Luzon burn a resinous wood and rub the ashes together with sugar-cane juice on a flat stone until a paste results. The teeth are first cleaned

with a piece of cloth for some time, and then the color is applied with the fingers which were dipped in wine before.

The natives of the Pelew Islands rub several herbs and shell-lime to a paste, with which they blacken their teeth. This operation is repeated on five successive days. The same custom was practiced in the Marianas Islands in former time, but has now become obsolete. The aborigines of Yap, one of the Caroline Islands, blacken their teeth by means of herbs.

Among the Rejangs of Sumatra both men and women alter the appearance of their teeth by dyeing them black. The women of Lampong file the enamel off so that their teeth could keep better the shining black color which they try to give them. The Orang Mamma, a fishing and hunting tribe of Sumatra, after filing off the crowns of their front teeth down to the gums at the age of puberty, varnish the stumps and also the other teeth with the juice of a fig-tree. The Battak obtain the black color by burning lemon wood.

On the Asiatic continent, the habit of blackening the teeth is met with among the Anamese, the women of Burma, and occasionally also the Tonkinese and Siamese. The native girls of Cambodia practice the custom as a nuptial rite.

From passages in the writings of Bancroft, Hamy, Bastian and Schröder we learn that several Indian tribes of Central and South America are acquainted with the custom of tinging their teeth. The Chaymas of Guyana make them black, as did the Guijiros and the inhabitants of Cumana several centuries ago. The Choco Indians, too, blacken their teeth. Of the Nahu Indians of Central America, Bancroft tells that they first cleaned their teeth and then painted them with cochineal.

The natives of Madagascar, chiefly those living in the central section of the island, paint their teeth black with a certain paste. They dye them according to certain

designs by blackening certain teeth and leaving others unstained.

On the African continent the red color is preferred by those tribes that practice the custom of dyeing the teeth. It is not very common there, and is known only to the natives of Bornu, which is a part of Nigeria, southwest of Lake Chad, several tribes of Adamawa, the Wanyamwezi, and the Moroccans. The Wanyamwezi use as coloring matter the fruits of "mkua" (Hexalobus senegalensis). The Haussa women, the natives of the station of Amagede on the Binue River and a few other tribes, redden their front teeth and gums by chewing guru nuts (cola nuts, the fruits of Cola acuminata), which are used by the natives in much the same way as betel is used by the Malays. It is chiefly the women who like to have red teeth in these regions. The Moroccan women paint their faces, eyebrows, lips, and also their teeth.

There are also several Hindu tribes who have the habit of dyeing their teeth red. The inhabitants of Gujarat considered red as that color which pleases their gods more than any other, therefore both bride and bridegroom have their teeth reddened a few days before the wedding. They use the following method: From the young shoots of Ficus religiosa and some other trees flows, owing to the puncture of an insect belonging to the genus Coccus, a resinous substance, lac, which contains a brilliant scarlet dye. This resin is boiled in water until it becomes plastic, and then pieces of cotton are soaked with it and rolled to form small balls. If someone wishes to dye the teeth, he first keeps tamarind in the mouth for about two or three hours, then he replaces it by a slice of lemon which he holds between the teeth for five to six hours. This apparently causes a superficial decalcination of the enamel, thus making possible an easy penetration of the coloring-matter. One of the cotton balls is placed in hot water which instantly becomes deep-red. With this water a piece of cloth is

soaked and applied to the teeth. Another piece of cotton is moistened with the decoction of the twigs of Rubia cordifolia and administered to the dyed teeth as a fixative. Teeth which were stained after this method keep their color for twenty years and longer.

CHAPTER XXVII

THE DECORATION OF THE TEETH WITH INLAYS

The natives of the Malay Archipelago, of Japan, and of Central America are reported to adorn their teeth with inlays of metal, especially gold, of diamonds, or of mother-of-pearl. Usually cavities are produced artificially by drilling holes in the dentine, which are filled with the jewel, or in rarer instances the teeth are covered with gold-leaf. We know that occasionally even civilized people wear diamonds in their incisors; there are rich American and Parisian dames who are anxious to show their wealth in every possible—and impossible—way. Some hyper-ostentatious specimens have found the way back to the primitive conditions of the head hunters and scalp hunters by having a modern dentist put in precious stones in carefully prepared cavities. That such a mark of distinction may not always be very useful shows a note that circulated in the German newspapers in October, 1922. "Golden teeth decorated with diamonds were the special marks of one pretended Count Harry von Waldberg, who was wanted from Augsburg because of fraud and theft. This man is a check swindler who had been repeatedly sentenced, a dentist by profession. The last time he had cheated an Augsburg tailor of his overcoat. In the notice of the police it was mentioned that the man had in his upper jaw golden teeth garnished with diamonds. In order not to be recognized the swindler should have taken off not only the stolen overcoat but also his diamond teeth. With these, however, he apparently

could not part. Policemen met yesterday in the street a man with these particular marks and arrested him." It was soon found that he was the swindler.

The custom of adorning the teeth is very familiar to the Battaks of Sumatra, the Dyaks of Borneo, and the Toradjas of Central Celebes. Of the latter, the brothers Sarasin say: "Finally, among the forms of jewelry, also the garnishing of the front teeth with gold, which we have observed several times, must be mentioned."

Of the Battaks, Freiherr von Brenner reports this: "The very noble Battaks, not contented with the filing of their teeth, also make use of gold, so that the teeth may testify their riches by their costly appearance. This is done in the form of narrow stripes extending along the gums; in single rare cases the teeth are lined entirely with the metal which occasionally is even supplied with small ornaments. Further, not infrequently gold or mother-of-pearl inlays are seen, which are round at the incisors, but triangular at the canine teeth, the vertex being directed toward the gums. For this purpose, first the corresponding cavities are made in the teeth; in the two eye-teeth, before their being covered with gold or with mother-of-pearl, a magic remedy is placed which is believed to have the power of protecting against poisoning. Due to the chewing of sirih, the mother-of-pearl leaves assume a golden, shining color, so that their differentiation from real gold is quite difficult."

Selenka says of the Dyaks that the upper row of their front teeth contains brass or gold platelets, about two to three millimeters in diameter. "This strange decoration comes into full effect if its bearer speaks in that the metal plates flash up suddenly like a row of golden lights and enliven the brownish face with a piquant sparkling shine. It always produced great sympathy if I showed the Dyaks my gold-filled teeth. They gave me each time the kind advice also to dye my teeth black." The Dyaks also bore a canal through the enamel to the interior of the incisors

and eyeteeth and drive a small yellow nail, usually of brass with a round head, into each canal.

In Japan the custom of adorning the teeth with inlays is rare and relatively recent. It is recorded only by Schröder who says: "Of particular interest to me was the fact that the Japanese, too, are enthusiastic about the lining of teeth with gold, in the very recent time, of course, and that they do not consider the blackening of the teeth the only charming decoration." He quotes a passage from the "Korrespondenzblatt für Zahnärzte," 1887, No. IV, which says: "The Japanese have such a great liking for gold fillings that they frequently bore artificial cavities in healthy teeth and fill them with gold; as a reason for this they give that it is a sign of advanced civilization."

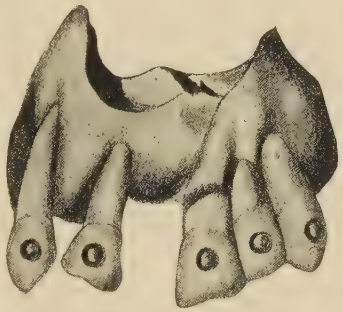
The classical country for this kind of dental mutilation is Central America. According to Saville, in various parts of Mexico, Central America, and the province of Esmeraldas, Ecuador, skulls of the aborigines were found, the front teeth of which were inlaid with gold, turquoise, rock crystal, red cement and other foreign substances. Taylor reports that in the Peabody Museum of Harvard University there are teeth in which had been placed inlays of jade, iron pyrites and gold, some of them arranged symmetrically in triangles, also banded inlays, all of which apparently were used for ornamentation.

Hamy, in his article on the dental deformations in Mexico and in Yucatan, mentions that the Indians of the province of Panuco bored holes in their teeth which they cemented with a black substance.

The researches made in Campeche during the French occupation yielded the discovery of a fragment of an upper jawbone which Hamy describes thus: "This fragment which comprises a part of the frontal bone and almost the whole of the face, was found together with a few small figures in a tomb in the surroundings of Campeche. It shows the upper dental arch in its natural state. The right

middle incisor is missing; in the center of the facial surface of the other front teeth there is a cylindrical hole in each, which is three millimeters in diameter and in which a hard stone of bluish green color is inlaid."

"The visible portion of these stones which are declared by Dr. Fucier as being genuine turquoise is convex and shows a pretty polish. Two of the stones have disappeared from their hollows, those of the right eye-tooth and of the left middle incisor. It is easily seen that the cavities which may be as deep as one millimeter must have been produced with the help of a boring instrument. The operation required a considerable length of time, and one understands easily that such a prolonged treatment of the teeth could not be done with luck or with success in living individuals. The attentive and precise examination of this valuable piece proves very clearly that the work was done post mortem, as there are no pathological changes in the neighborhood."



The Inlayed Teeth of the Campeche Skull.

In the ruins of Tejar, near Medellin, the fragment of a clay statue was unearthed which, besides the flattened skull of the Tolteks, also displays cavities in the facial surfaces of the upper incisors, the artistic elaboration of which is ascribed to the Huazteks.

From Schröder these notes may be cited: "J. G. Owen, who undertook various excavations and researches in Copan, Central America, during the summer of 1892 for the Peabody Museum, found in a skeleton exhumed there in the upper jaw an incisor, on the labial surface of which there was an inlay of green stone which was almost quadrangular; its corners were rounded. In the neighboring tooth there

was a similar inlay of red cement, which had become loosened to such a degree that it fell out when the jaw was examined. Professor Owen was of the opinion that these inlays, made centuries ago, were not intended for the purpose of filling pathological cavities, but for the decoration of the teeth. Cortez found about 300 years ago in the ruins of a town in Guatemala similar specimens of strange adornments of the teeth. Stephens believes that the primitive peoples in whose teeth such inlays were found, used for the preparation of the cavities required for their reception, small instruments of quartz which existed in various sizes."

CHAPTER XXVIII

THE PRODUCTION OF ARTIFICAL PROGNATHISM

Faidherbe, in 1872, was the first to describe a rare form of dental mutilation which he found to be prevalent in the population of Senegal, consisting of a mixture of Arabs, Berbers and negroes. Only women submit there to the operation, through which the projection forward of the front upper teeth becomes increased, thus resulting in artificial prognathism. Thulié, in 1875, and Hamy, in 1879, made the same observation. Hamy found in the skull of a thirty-year-old negress of St. Louis, the capital of the French colony of Senegal, the two upper incisors pushed forward. This abnormality was produced by removing the deciduous incisors at an early date and applying a constant pressure to the erupting permanent front teeth, partly by pulling them with the finger and partly by pushing them forward with the tongue. It is clear that gradually not only the natural position of the teeth themselves are altered, but also the bone formation of the face undergoes a corresponding change. The prognathism of the upper jaw exercises a decided influence upon the shape of the mandible which, in order to reach the widely protruded maxilla, participates in the deformation in the form of a compensatory forward projection of its central portion with the lower incisors. This mutilation gives the mouth a snouty appearance. It is not compulsory and has no particular religious significance, but is practiced merely because artificial prognathism is considered beautiful by the natives of Senegal.

It is also met with among some tribes of eastern Africa.

The Masai push the upper central incisors of their boys and girls forward and remove the lower central incisors at the time of puberty, when the boys reach their sixteenth and the girls their twelfth year of age. It is not the witch doctor, but a specialist, who performs the operation. Says J. Thomson: "When the Masai infant outgrew the mother's milk, it exercised its erupting teeth on a big lump of beef. This was, of course, a very blamable habit of our young friend, for it is responible for the ugly position of the teeth, which he has in common with the rest of his tribesmen. The gums still being tender and the beef tough, the teeth assume an outward position which does not look pretty and, which is still worse, seems to separate them from one another until they look like single fangs." The Masai, however, have an altogether different conception of beauty; they like the deformation very well and prefer it to the natural position of the teeth.

The Pride of the Prince of Kiaba

The two upper central front teeth stand apart and are prolonged as a result of artificial prognathism.

The Wataturu, who are closely related to the Masai, used to deform their teeth in the same manner, by bending forward the upper front teeth and knocking out the lower incisors; nowadays their enthusiasm has decreased; only very few submit to the operation at the present time.

The Wafiomi, a Hamitic tribe living in the regions of Ufiomi, Iraku, Uassi and Burungu, protrude the upper incisors. The deformation is, according to Stuhlmann, further met with occasionally among the Wakamba, Wataiti, the tribes of the Kilimanjaro valley, some individuals of

Usambara and the adjacent regions, the populace of Turu, Umbugwe and Irangi, finally the Wakaguru and Wagogo.

The natives living near the Kongo River obtain a similar effect, artificial prognathism, by separating the upper central incisors from each other by means of a wedge. Zintgraff saw several individuals there whose upper incisors stood so far apart, that one has to believe they were pushed apart artificially by means of small wedges driven between them. The Prince of Kiaba, Zintgraff relates, had the two upper central incisors protruding in the shape of a fork. Even when his mouth was closed, these two teeth were partly outside of the oval cavity. They were twice as long as the other teeth, and the Prince seemed to be very proud of this ornament.

PART V

TEETH AS USED OUTSIDE OF THE ORAL CAVITY

CHAPTER XXIX

TEETH USED AS TOOLS AND MEDICAL INSTRUMENTS

It is generally known that the mouth, with its two lines of sharp teeth, serves primitive peoples, not alone for the purpose of biting and chewing their food, but also as a tool. Sumner remarks that the Seri Indians of southern California still use their teeth and claws like beasts. Likewise, outside of the oral cavity we not infrequently meet with teeth and parts of the jawbone used as tools. The natives of the tropic forests of South America use the sharp teeth of the piraya, or Serrasalmo, as knives, and utilize dogfish mandibles with their sharp, pointed canine teeth as awls and drills. Capybara teeth, mounted on the ends of ape bones, serve the Siriono in the woods of northeastern Bolivia and the Guayaki in southeastern Paraguay as chisels. The palometa, a fish which weighs two or three pounds, has fourteen teeth in each jaw so sharp that the Abipones, an uncivilized tribe of the Guaycuran stock, shear sheep with the jaw. Among the ancient Hebrews, teeth of some animals seem to have been used for butchering purposes, for there is an especial law in the Talmud which forbids the slaughtering of animals with teeth which are still attached to their jaw, "because they might strangle."

It might appear strange to us to learn that teeth are used as toilet articles, yet we find that the natives of Terra del Fuego, on the southern coast of South America, use a comb in the dressing of their hair, that is made from a piece of dolphin jaw. The tusks of the walrus are used by the Chukchi, a Mongolian tribe in the northern edge of Siberia,

for the making of drinking cups, The Eskimo men and women carve, from walrus ivory, the daintiest handles for their scrapes and other implements.

In the whole civilized world, as is well known, the ivory of elephant's teeth is used for the most varied articles. But this is not the place to treat of these latter, since in so doing we would be dealing with a regular branch of industry and not with a merely folkloristic use. The same remark applies, though possibly not to the same extent, to the use of the teeth of the sperm-whale (Physeter macrocephalus) and the narwhal (Monodon monoceros).

Relative to the use of the teeth and parts of the jawbones as surgical instruments, several examples may be given. The Karaya Indians in Brazil make, for scarifying purposes, special instruments which they call i-shaura. Such an apparatus consists of a triangular or quadrangular piece of cuyen shell, a kind of native nut, one surface of which is covered with a centimeter-thick layer of wax or resin, the other surface bearing a line of small, sharp fish teeth. These cupping instruments are kept in pairs, the concave surface of the one lying against the convex surface of the other. The small teeth are protected by a layer of cotton placed between the two. The natives of Tahiti, Samoa, Tonga and the Loyalty Islands open their boils and furuncles and even deep-seated abcesses very frequently with sharks' teeth. Hamilton saw how, in the Nicobar Islands, the mandible of a fish with sharp teeth was put upon a boil and then beaten with a stick. The result, he states, was a profuse hemorrhage followed by early healing.

CHAPTER XXX

TEETH USED AS DRUGS, AMULETS AND CHARMS

Very frequently teeth of man and animals are used both as drugs and health-protecting amulets. It is hardly possible to treat the chapter of medicaments and magic talismans separately. In the primitive belief of the savages and our own uncultured people, both conceptions merge into one. If a superstitious man hangs the tooth of some animal about his neck when he is suffering from any kind of physical discomfort, then it is to him, in the real sense of the word, a medicament believed to possess healing or protecting power.

We have, in the preceding chapters, become acquainted with the important part which teeth play in the treatment of uneasy dentition and in the cure of toothache. They also help in a great number of other diseases. The milk teeth of children which have fallen out without recourse to extraction are made ingredients of various medicaments in Anam. According to Pliny, the first tooth which a child has lost, cures pain of the uterus. Teeth of an old woman are used as a fertility charm in the yam garden of the New Caledonians. A bewitched man is able to cast off the spell put upon him by fumigating himself with a pulverized human tooth, by eating a woodpecker, or smearing the skin with raven's gall. The teeth of a man who had been killed in the war or otherwise were thought to be very efficient talismans against the loss of the generative power. Pulverized human teeth also cure epilepsy. In the Harz, teeth of the dead have a great virtue for the relief of headache. Teeth

of the dead, taken at midnight from the grave, were carried by the young men of the Tyrol to relieve them from the obligation to military service when it was their time to draw lots for this service, as was customary in former centuries. A Latin pamphlet of 1497, cited by Thorndike, tells that, if a man's tooth and a hoopœ's wing are suspended over a sleeper, he will not awake until they are removed. The Tibetans heal bone fractures with tartar from the teeth.

Teeth of animals form a part of the indispensable armamentarium of the "medicine man" of untutored races. The medicine man of the Ganga, a tribe of the Loango negroes, carries in his medicine bag in addition to stones, nuts, mussel shells and pieces of horn, also snake's teeth, small scrapings from the latter being considered by the natives as powerful drugs. In a similar sense, teeth of animals form a part of the equipment of the witch doctors among the tribes of the tropic forests of South America. In the Loyalty Islands priests wear when praying, tied to their foreheads or arms charms consisting of teeth, hair or nails of ancestors.

According to Albertus Magnus, dogs' teeth should be suspended from the neck of a patient suffering from jaundice. Dioscorides tells us that people bitten by a mad dog used a tooth of the dog who bit them, placed in a bladder and fastened upon one arm, in order to protect them from the outbreak of hydrophobia. Dogs will not bark at one who holds in his hand the tooth of a black dog, "and so robbers carry such a tooth with them at night."

Wolfs' teeth help people who walk in their sleep. If pulverized and mixed with wine they are good for umbilical rupture as a local application to the navel. In Swabia a powder made of wolfs' teeth helps in the treatment of vertigo. There, the one who carries a wolf's tooth in the pocket never becomes fatigued in running. Similarly, the Swabians tie a wolf's tooth about their horse's neck trusting thereby to keep it from tiring. In England, the heliotrope, if plucked when the sun is in the sign of Leo, in August, and

worn wrapped in a laurel leaf with the tooth of a wolf, insures that the bearer of it will be addressed with none but friendly words. A wolf's tooth helps against nightmare in Bohemia.

Among the ancient Hebrews the tooth of a fox was considered an excellent hypnotic, but it must needs be the tooth from a dead fox; if the tooth were from a living fox, then it was thought to prevent sleep.

Ground tigers' teeth are used by the Anamese as drugs against the whooping-cough, by the inhabitants of Hindustan against all kinds of maladies.

The teeth of the hyena have also their fame as medicaments. If one pulls them out of the left side of the animal's mouth and binds them in a sheep's or buck's hide, abdominal pain and colics will disappear.

The tooth of a bear is a talisman for the Ostiaks, a tribe in Siberia, which protects them against both disease and danger.

Perlèche, an eczematous condition of the corners of the mouth occurring in children, heals in Bukowina if touched with the teeth of a horse. In Ruppin, Brandenburg, you will be freed from fever, if you pull two left teeth from the cadaver of a castrated horse and burn them to powder and then take some of the power internally.

The teeth of a mole, worn on the chest in a small bag, are good for the gout. Another medicament for this disease was described by Lucian. The tooth of a weasel which has been killed in a certain specified way should be raised by the left hand from the soil, wrapped in the skin of a recently killed lion or in the hide of a virgin hind, and put on the gouty foot.

The scrapings of an elephant's tooth healed paronychia in pre-Christian times; it was believed to have astringent power. By a mixture of ivory scrapings and Attic honey, spots on the face may be removed, as is thought in Greece. Ground ivory was used against diabetes by the Chinese.

Warts fade away if they are scratched with the tooth of an otter.

Fever may be cured by hanging the teeth of all sorts of serpents round the patient's neck; these teeth must have been pulled while the serpents were alive.

During the Middle Ages pikes' teeth were a part of the Bavarian apothecary stock. Burnt pikes' teeth were an ingredient of an ointment which also contained olive oil, yolk oil, badger fat and white lead, and which was used in cases of chronic suppurative ulcerations. A prescription against neuralgic pain in the breasts, quoted by Kräutermann, reads thus: "Of a green pike, which must be dry and of medium size, take both jaws with teeth and both eyes and dry and pulverize them. The powder should be taken in warm beer, either in one dose, or evenings and mornings, on one day only or on three successive days." Against goiter the same author devises this: "Take equal parts of pikes' teeth, crayfish's eyes, and sponge, pulverize, put the powder in a new pot which was filled with the patient's urine. Let the whole evaporate in the oven until it is reduced to a powder. Of this, take in the morning before breakfast a small portion in wine at the time of the waning moon."

It is well known that teeth, in the belief of superstitious people, are able to protect one from the evil eye, particularly in Italy where teeth of the wild boar, teeth of fish, of horses, in fact, teeth of all kinds of animals are worn for their purpose. In Otranto the teeth of sharks mounted in silver are carried for protection against "jettatura" (the evil eye). Above the portal of the cathedral in Seville, Spain, hangs an elephant's tooth on a chain. In Montferrat, Italy, the people carry two incisors of a horse with them as a protection from all kinds of evil, also wolfs' teeth and the fangs of a wild boar, are used for this reason. In Egypt, Morocco and the Sudan the fangs of the wild boar are a never failing talisman against the evil eye, and the Hindus use tigers' teeth with similar purport.

In Madagascar crocodiles' teeth are carried either singly or in necklaces with the same purpose in view. Imitations of crocodiles' teeth in gold or silver, to which protecting powers were ascribed, formed the most important part of the jewelry of the Malagasy people; to-day, a golden copy of a crocodile's tooth is attached to the crown of the king.

Even animals are safeguarded against the evil eye by carrying teeth. Among the ancient Romans the animals carried the fangs of a wild boar on their foreheads. One will find in Persia at the present time that each horse carries an amulet upon its neck, to which a wild boar's tooth is fastened. In Jerusalem the so-called "moon-amulet" which they hang about their horses' necks, usually consists of wild boars' teeth which are mounted in pairs and so arranged that their ends when mounted correspond to the two points of the crescent. These amulets are often elaborately ornamented with gold, silver and jewels. Occasionally there are two of these crescents, superimposed one above the other, on the neck of extraordinarily pretty or valuable horses. They are hung by a cord made of goat's hair.

A very important part was played in the Middle Ages by the tusks of the narwhal (Monodon monoceros). These were considered as representing the horn of the unicorn referred to in the Bible. An enormous supernatural power was attributed to them because of this and because they were also very rare up to comparatively recent times, or within the last two hundred and fifty years, in Europe. Extremely expensive scepters were made of them, and as medicaments they were especially valued, there being a superstitious worship attached to their use in both instances. Four such teeth were kept by the Margraves of Baireuth in their archives at the Plessenburg in the sixteenth century, as extraordinary varities. One of them was received by two members of the dynasty from Charles V as payment for a high debt, and for the largest one the senate of Venice, in the year of 1559, made an offer of not less than 30,000

sequins ($67,500) without being able to obtain it. One served the Margraves and their families as a medicament, and so highly was it valued that each time it was taken from its case or cabinet a representative of the prince had to be present. Three narwhal tusks were used in the ancient throne of the Kings of Denmark. Later, after the propagation of navigation, when the populace had the opportunity of seeing many such teeth and of appraising them at their true value, they lost, as a result, much of their hypothetical value, and there was a lessening of the superstitious awe in which they were previously held. When, in the beginning of the eighteenth century, the Greenlandish Society had sent a number of large narwhals' tusks to Moscow with the intention to sell them to the Tsar, the Emperor's physician in ordinary succeeded in preventing or even cancelling the bargain by declaring that they had nothing to do with the fabulous unicorn but were simple narwhals' tusks. Nevertheless, though the simple and implicit belief of the people in the healing power of these teeth was thus much lessened, they were still to be found at the close of the last century in several apothecaries' shops. At the present time they bring considerable prices only from the Chinese and Japanese, to whom they are sold mostly by Dutch merchants.

In the folk-tales and legends of Hungary and southern Germany, "the crowns of the serpents' king" are very valuable and highly esteemed talismans of all treasure-seekers. They also enjoy great appreciation among the Russians and in Prussia. Peters, anatomist at the University of Berlin, who often had the opportunity to examine such "crowns," which were either for sale or in the possession of private persons, found that they were simple, undeveloped sucking pigs' teeth "which had just come out of their hulls and the roots of which were not yet filled with enamel, so that, with their lozenge-shaped spaces, they looked indeed like small bony crowns." Wlislocki saw four such crowns,

one of these, which was mounted in gold, was fastened to a bracelet of the Von Tamásy family in Háromszék, Hungary. The other three were owned by treasure-seekers, and each of these "serpents' king's crowns" was a lozenge-shaped, undeveloped tooth of a pig. Such so-called serpent-stones are, according to people's belief, located in the heads of "white" snakes (fairies who had been turned to snakes, or the souls of deceased who want to rid themselves of their treasures), or they constitute a part of the serpents' king's crown, and used to be worn in former times by the aristocrats as amulets, mounted in gold or in silver.

In West Africa, when the Mani of Chitombe or Jumba died, the people used to run in crowds to the corpse and tear out his hair, teeth and nails, which they kept as a rain charm, believing that otherwise no rain would fall.

Teeth are very popular charms among the American Indians. The Piaroa Indians in Venezuela believe that all sickness and other ills are caused by the contamination of white men. To avoid this, they wear amulets which are made of tapir's teeth cut, bored for suspension, decorated with incised designs and with bits of flint, glass or crystal attached. When these are worn in the presence of white persons, all evil is avoided. They are called "guanares."

The upper incisors of the cuscus, or native opossum, are used in the Gazell Peninsula, New Britain, Malanesia, to make men's girdles which are worn as love charms.

When Lieutenant Lux killed a leopard on the banks of the Kwango River, the negroes asked for the animal's teeth in the belief that they were of great value and would protect the hunter carrying them from missing his shots.

According to Greene, the native Rhodesian witch doctor has a necklace of human teeth, symbolical of his power over life and death. "When the teeth first appear, then life *is;* when they have gone, how far off is death?"

The native children of the Fiji Islands are not allowed to touch the teeth of a whale, for doing so would make them

unhappy for the rest of their lives. This is an example of the superstition that teeth may not only restore poor health but also have an ill-effect on people's physical condition. Thus among some of the tribes about the river Darling, in New South Wales, the extracted tooth of a lad was placed under the bark of a tree near a river or water-hole; if the bark grew over the tooth, or if the tooth fell into the water, all was well; but if it were exposed and the ants ran over it, the natives believed that the boy would suffer from a disease of the mouth.

Among the Murring and other tribes of New South Wales the extracted tooth was first taken care of by an old man, and then passed from one headman to another, until it had gone all around the community, when it came back to the lad's father, and finally to the lad himself. But it was very dangerous to place such a tooth in a bag containing magical substances, for the magic of these substances might pass into the tooth and thus injure the boy. Howitt once acted as custodian of the teeth which had been knocked out from some novices at a ceremony of initiation, and the old men earnestly besought him not to carry them in a bag in which they knew that he had some quartz crystals. Nearly a year after the explorer's return from the ceremony he was visited by one of the principal men of the Murring tribe, who traveled some two hundred and fifty miles from his home to fetch back the teeth. This man declared that he had been sent for them because one of the boys had fallen into ill health and it was believed that the teeth had received some injury which had affected the lad. He was assured that the teeth had been kept in a box apart from any substances, like quartz crystals, which could influence them, and he returned home, bearing the teeth with him carefully wrapped up and concealed.

In the Dieri tribe of South Australia the teeth knocked out at initiation were bound up in emu feathers, or kept by the lad's father or his next relative until the mouth

had healed, and even for a long time afterward. Then a ceremony was performed by the father and a few old men of the tribe for the purpose of taking all the supposed life out of the teeth. He made a low, rumbling noise without uttering any words, blew two or three times with his mouth, and jerked the teeth through his hand to some little distance. After that he buried them about eighteen inches under ground. The jerking movement was meant to show that he thereby took all the life out of the teeth. Had he failed to do so, the boy would, in the belief of the natives, have been liable to have an ulcerated and wry mouth, impediment in speech, and ultimately a distorted face.

The Cholones of eastern Peru think that to carry the poison tooth of a serpent is a protection against the bite of a serpent. The natives of Rio, Brazil, preserve the poison tooth of a snake in cachaca, a kind of whiskey, and if somebody is bitten by a snake he drinks of this whiskey.

CHAPTER XXXI

TEETH USED AS RELICS AND SOUVENIRS

If the teeth of animals have such a marvelous effect as described in the preceding chapter, then we cannot wonder at the fact that an extraordinary virtue is attributed to the teeth of greatly esteemed or renowned people. We can readily understand why the dental organs of saints were often stolen or purchased for enormous sums to be used for relics. So, likewise, the teeth of ancestors were reverenced as remembrances, and later, because of their great age, valued as sacred relics which were supposed to protect their owners from injury and from the influence of malevolent and disease-producing demons.

The most renowned example of these is perhaps to be found in the history of the celebrated tooth of Buddha. Tracing the worship of this relic, we unearth a strange and fantastic history indeed. In the temple of Kandy, India, there is assumed to exist, among other treasures of incalculable value, that most sacred and precious piece, the tooth of Buddha, which is esteemed with devotion by four hundred and fifty millions of people. It is said to be one of the four canine teeth of Gautama, which were among his seven great relics, and has been famous in Ceylonese Buddhism as the Dalada. Its miraculous preservation from every means taken to destroy it by a hostile Indian king, and its ultimate arrival in Ceylon in the year of 312, are the subjects of a long narrative, and the Chinese traveler Fa-hian describes the procession of the relic as he saw it in 405. In the thirteenth century Dhammakitti wrote a Pali poem about it, based on an older Singhalese

work in prose and named "Datha Vamsa." Once it was sold for many millions to the King of Burma. At a later time the Portuguese are believed to have crushed it into fragments and burned and then thrown it into the ocean, yet the Ceylonese preserved it at Kandy in a shrine in its original form and size, the size of a hippopotamus' tooth; but, we must remember that it was not taken from a common mortal man's mouth but that of the worshiped superman, Buddha.

The people of Ceylon also worship the tooth of an elephant, those of Malabar the tooth of a monkey. The Siamese once offered a Portuguese 700,000 ducats for the redemption of a monkey's tooth.

The worship of teeth as relics leads to the study of dental organs in their capacity as souvenirs, a custom owing its continuance to various assigned reasons—superstitions, religious, political, personal, and others. It is very well known that even in the most civilized countries people often carry their own extracted or fallen out teeth in their pockets or purses for months or years. Widespread, says Clodd, is the custom among "yokels," and some of their "betters," of preserving teeth so that the owner may not lack them at the resurrection. The pains taken by the Chinese to preserve corpses entire and free from decay seems to be founded on a firm belief in the resurrection of the dead; hence it is natural to find their ancient books laying down a rule that the hair, nails and teeth which have fallen out during life should be buried with the dead in the coffin, or at least in the grave. The Armenians do not throw away their cut hair and nails and extracted teeth, but hide them in places that are esteemed holy, such as a crack in the church wall, a pillar of the house, or a hollow tree. They think that all these severed portions of themselves will be wanted at the resurrection, and that he who has not stowed them away in a safe place will have to hunt about for them on the great day. In a like spirit peasants of the Vosges

will sometimes bury their extracted teeth secretly, marking the spot well so that they may be able to walk straight to it on the resurrection day.

When the Jaga or King of Cassange, in Angola, has departed this life, an official extracts a tooth from the deceased monarch and presents it to his successor, who deposits it along with the teeth of former kings in a box which is the sole property of the crown, and without which no Jaga can legitimately exercise the regal power.

Tshongata is the name of a necklace of the Mincopies, in the Andaman Islands, which consists of human bones, and especially of pieces of the jaws, and the teeth of persons long dead. The belief is that the spirits of those to whom the teeth originally belonged will, in repayment for the honor and reverence and respect thus shown, protect the wearer of their teeth against demons, evil spirits and the other powers of darkness.

The Basutos are careful to conceal their extracted teeth, lest these should fall into the hands of certain mythical beings called "baloi," who haunt graves and could harm the owner of the tooth by working magic on it.

It is very frequent everywhere for mothers to keep and cherish their children's cast or extracted milk teeth. Crooke states that "English mothers hide away the first tooth of a child"; in Basle, Switzerland, the first lost tooth of a child is kept as a souvenir and often mounted in a finger ring.

Also the extracted teeth of other relatives are not infrequently worn as souvenirs. There is a delightful anecdote caricaturing this custom: Mr. Jones is not only an enthusiastic lover of gems, he also believes that he is a great connoisseur.

One day, a traveling salesman enters his office. This man, who has not a single piece of jewelry on him, not even a breast-pin, has a precious pearl hang down as berloque from his watch chain.

Jones is enraptured.

"By golly! Where in the world did you get this?"

"From my wife."

"This shade!—This greyish-blue color!—This size!—Man, this piece is not to be had in the trade."

This the lucky owner affirms proudly.

"But the value—the enormous value!"

The salesman smiles.

Jones is startled: "Or is it not genuine?"

"But, Mr. Jones, what a question!"

Jones gazes at the berloque as if hypnotized: "How much do you want for it?"

"But Mr. Jones, what are you going to do with my wife's —molar tooth?"

CHAPTER XXXII

TEETH USED AS JEWELRY

After discussing the use of teeth as tools, surgical instruments, drugs, amulets and talismans, and as relics and souvenirs, we have to deal with their use as trophies, whether as indicators of enemies killed in battle or of animals killed in the hunt. Just as men, civilized and uncivilized the world over, utilize the horns and antlers of game which they have killed, and even of animals which they did not themselves kill, as room ornaments, so also many other persons carry teeth of rabbits, weasels, wild boars, elks (the latter particularly in America, where they are an official emblem of the Elks' Lodge), etc., ad infinitum, as watch fobs, tie pins, cuff buttons, and in some regions also in rings, as, for instance, in the villages of Brunswick.

The significance of teeth as trophies is very drastically shown in the instance of the cannibals of Sumatra, of whom Brenner tells many interesting things. The cannibal King Si Gallak owned a bamboo box which he valued very highly because of the fact that in the lid of this box there was mounted a tooth of a killed and eaten enemy whom he had hated terribly. Through the medium of this tooth he felt himself able to persecute this fallen enemy with his vindictiveness, even beyond the realms of the living. Each time that he closed the lid of the box he would beat the tooth thereon, and was said to have had the agreeable feeling that he was giving his enemy thereby a veritable slap in the face. Si Gallak later suffered the same fate as he had meted out to this enemy of his; he was captured, killed and eaten. His teeth were likewise knocked out of his skull and the enemies

who had been his Nemesis mounted these upon their sirih boxes. When they shut the lids of these boxes, so was their explanation, they had the same feeling above referred to, and that it was as though they gave Si Gallak himself "a slap in the mouth."

Among many negro tribes, following the wars between adjacent clans, the victors carry the teeth and frequently the whole jaw bones of their destroyed enemies as necklaces and other ornaments. They often knock out the teeth of their captives for the same purpose.

The character of teeth ornaments as trophies is also very evident in the case of the American Indians. The men wear necklaces of teeth taken only from such ferocious animals as they have killed themselves. The ornament, therefore, becomes a mark of distinction and is rarely parted with for any consideration. Necklaces of bush-hog's teeth are worn practically by every adult male Indian of British Guiana. Only the two upper canine teeth of the animal are used, so that a large necklace will represent fifty or more animals. The teeth are filed until the four sides are flat and the top is filed to a point. The bases are embedded in a compact cotton cord from which tasseled ends hang down the wearer's back. The necklace is frequently taken apart and cleaned. Among all Amazonian tribes these teeth ornaments are, apart from being a showy decoration, a mark of prowess.

In most cases, however, the original significance of such ornamentation has long since been forgotten, and the teeth are estimated merely as jewelry intended for nothing else but the beautification of the wearer's appearance. Thus, in Brazil and Colombia, not only the men wear necklaces of jaguar's or human teeth but also women and children decorate themselves with teeth of jaguars, boars and monkeys. The same is the case among the natives of Costa Rica. Rodents' teeth are a part of ear pendants of the Guahibo Indians of Colombia. The aborigines of Peru

and Ecuador have wrist or arm-bands worn during dances and ceremonies, which are made of perforated monkey teeth, black seeds and bird bone artistically strung on netted fiber cords of a fringe of iridescent green beetle wings. Necklaces of jaguar's and ocelot's teeth and anklets of monkey's teeth, as worn by a great number of Indian tribes, are shown in the Marshall Field Museum at Chicago; the collection kept there contains specimens from Argentine, Brazil, Paraguay, Bolivia, Peru, Ecuador, Colombia, Venezuela, Panama, and Costa Rica. In Panama the necklaces consist of teeth of peccaries, agoutis, pumas and ocelots.

The Eskimos of Alaska have necklaces made out of teeth. A special ornament worn by their women is a favorite waist belt made from the incisor teeth of reindeer. These are obtained by cutting off tips of the lower jaw, leaving sufficient bone to retain the teeth in their natural position. The rows of teeth are then sewed to a strap of rawhide, one set overlapping the next in scale-like succession. As each set of teeth represents a reindeer, it is evident that a long period of hunting is necessary for each belt. The Kolushes, an Indian tribe of Alaska, carry shark's teeth in their ear lobes.

Dental ornaments are quite common among the natives of the Philippine Islands. The Ilongot of Luzon wear armlets made of the tusks of wild boars. These are supposed to belong properly to the men, yet women often wear them, too. The Amburayan and Benguet Igorot of Northern Luzon have arm ornaments made by joining two boars' tusks, so as to form a ring; they are worn by both men and women during festivals. Among the Bontoc Igorot, dogs' teeth are placed over the hair of women, making very attractive decorations. Necklaces are seldom worn by them, except during dances. Those then employed are generally of boars' tusks. The tusks are always worn pointing away from the breast. Men's armlets of boars' tusks, some with hair and realistic carvings attached, are worn during impor-

tant ceremonial occasions, particularly the celebration following a successful head-hunt. The Ifugao, too, have arm ornaments made of boars' tusks. The Mandaya of Southern Mindanao, Philippine Islands, wear necklaces made up of Chinese beads and crocodiles' teeth.

In the Melanesian group teeth are very popular as

Neck Ornament Made of Cuscus Teeth, Gazell Peninsula, New Britain, Melanesia

jewelry. The aborigines of the Gazell Peninsula, New Britain, have a neck ornament, called "ngut," which is very rare and valuable. It is made of about 1400 incisor teeth of the cuscus, or native opossum, which have been pierced at the base and fastened together with cord. These teeth are obtained chiefly in New Ireland (New Mecklenburg). This is the most costly ornament that the natives possess, and only the most wealthy can afford one of this kind. They also have nose ornaments, called "mum," made of a number of short sticks with cuscus teeth at the ends, and worn by sorcerers or medicine men of the ingiet society. In St. Matthias, a small island about twenty miles long, lying somewhat over a hundred miles northwest of New Ireland, necklaces of shells and teeth, preferably cuscus teeth, are sometimes worn but are not very common. In New Guinea necklaces of dog's teeth are most valued; woven bands ornamented with shells and teeth are worn around the forehead. In the region of South West Bay, Malekula, New Hebrides, boar's tusks are fastened at the corners of the mouths of the masks used by the natives in their ceremonial dances.

In the northern New Hebrides, especially Ambrym, Halekula and Santo, the pig occupies an important position in the social and religious ideas of the aborigines. There are many ranks or classes in the social scale, and in order to rise in rank a man must kill a certain number of pigs. Those pigs whose tusks form a complete circle or more are of special value, and only such count on certain occasions. The pigs are killed in connection with certain ceremonies or "mankes," which may extend over months. The lower jaws of all the pigs killed at any particular manke are cleaned and arranged in rows on a sloping platform under a shed near the manke grounds, and left there till the shed decays, when they are taken possession of by their individual owners, who either keep them hung up in their individual houses, or take out the tusks and use them as arm rings. As only those pigs whose tusks form a complete circle or

more can be used on certain occasions, those become knocked out, and the pig kept tied up near or in the house and fed on soft food. The boar has a separate name for every quarter circle added to the length of the tusk.

In the African Congo the natives make chains from the teeth of various animals and wear them as jewelry. In South Africa, Ricard states, in former times tiger's teeth were used for necklaces exclusively. Nowadays tigers have

Neck Ornament Made of Carved Boar's Tusks
Northern New Hebrides.

become scarce, at least in the European colonies, and therefore very frequently human teeth are used instead.

Even in the oldest prehistoric times teeth seem to have been used as jewelry. With the Magdalenian skeleton, found at Duruthy, was discovered a necklace of fifty canine teeth, three of lion and the rest of bear, most of them ornamented in some fashion: one with the figure of a seal and one with that of a pike. In one of the early neolithic strata of the cavern of Mas d'Azil the perforated teeth of deer and other animals were found arranged as if they had once formed necklaces. Among the ornaments unearthed in a grave near Stamford, were a beaver's tooth set in a shank of gilt metal and a horse's tooth pierced for suspension. In a ceremonial burial of thirty-three skulls in the grotto at Ofnet, on the Upper Danube, the skulls were ornamented with stag's teeth and shells.

Since teeth are considered so valuable that they are used for jewelry, they are appreciated so highly in certain regions that they are even used as legal tender. The teeth, as money, played a not unimportant part in earlier periods of history, but they are also employed to-day in this capacity among certain tribes. Abnormally formed wild boar's fangs (the kind described above) represent the currency of the people of New Guinea. In the northwestern Solomon Islands the currency consists of beasts' teeth of two kinds,—those of a kind of flying dog and of a kind of dolphin; each tooth is bored at the root and they are strung on thin cords.

Many African chiefs stored up ivory tusks for social prestige long before the white men came and gave them value in world commerce.

PART VI

MISCELLANEOUS

CHAPTER XXXIII

APPENDAGES

To show one's teeth. (To threaten; to resent.) This phrase is supposed to have been derived from the way dogs act if they are angry. In Poland, where the same phrase is used (pokazać zęby), the people give it an historical interpretation. They say that Stephen Bathori, King of Poland from 1576 to 1586, had on his escutcheon three wolf's teeth. When he issued an order, he used to sign it with his family coat of arms. Everybody knew the three wolf's teeth and that they did not tolerate any protests. Therefore, people said of their king: "He has shown them his teeth," a phrase which is still in use to indicate that nothing will deter him who shows his teeth from reaching his goal.

Hen's teeth. This is a simile of that which does not exist, or which is extremely rare, and is used in about the same sense as "black swan."

Celestial dentists. According to the communications purporting to have come from Raymond Lodge in the spirit world, there are celestial dentists who supply the spirits with new teeth; we are told that artificial dentures and limbs are provided there, and that "when anybody's blown to pieces, it takes some time for the spirit-body to complete itself, to gather itself all in."

The teeth of gods. Cicero, in his treatise on the nature of the gods, expresses the opinion that gods have no need of teeth: *"Dentes, palatum, fauces habebit deus nullum ad usum."* We have, nevertheless, learned of Heimdal Gullintanni's golden teeth, and found that Indian

mythology deals a good deal with the dental organs of its gods. We may add that Siva, the destroyer of life, according to Mahabharata, was supposed to have unusually large and very sharp teeth. The Japanese god, Agonashi-Jizo, cures the toothache in Japan. The people pray to him and then drop into the sea twelve pears, one for each of the twelve months. The name Agonashi-Jizo means "Jizo who has no jaw." For it is said that in one of his former lives Jizo had such a toothache in his lower jaw that he tore off his jaw and threw it away. The people of Oki made a statue to him without a jaw and pray to him to cure their toothache.

An Indian Demon Represented With Fangs

From a relief on a mug found in Chimbote, Peru.

The teeth in conversation of gestures. In Italy, to brush the index finger past the teeth is a sign of anger. To take the beard between the teeth stands for "repressed ire." To snap the thumb nail audibly against the front teeth means: "You won't get anything," or: "He does not leave a particle for me." To hold the nail of the index finger between the teeth and then let it glide off noisily, signifies: "Wait, I shall bite you."

Don't suck your teeth. This is a story told in the Sea Islands, south Carolina:

"Once upon a time the Devil was on earth. He stole a woman's girl. And every time he would steal this girl, she couldn't get away from him. He got her again. So this little girl's father made a plan to stop this. He knew the Devil was scared of lightning and thunder. So he went and

got some rotten eggs. And just as the Devil was coming, singing,—

'I'll eat the two to-day,'—

this man threw all the rotten eggs up. And big lightning and thunder came. And the Devil turned around and sucked his tooth. That's why it's not good for children to suck their teeth at people, because the Devil did that." The negroes of Virginia, South Carolina, Georgia, Alabama, and Florida, if a child sucks its teeth (bringing the upper teeth against the lower lip), old people will smack it in the mouth and say: "No good will follow you if you do dat." They say: "Devil suck his teet'. Devil would foller you til you get to heaven's gate. He done mad now, he lost you. Suck his teet', go back. Always suck his teet' when he lose a soul."

Tooth and egg. This is a corruption of Tutanag, a Chinese word for spelter, the metal of which canisters are made, and tea-chests lined. It is a mixture of English lead and tin from Quintang.

The Dragon's Teeth. The Grecian myth of the foundation of Thebes tells that Zeus, disguised as a bull, kidnapped Europa, the daughter of Agenor, King of Sidon. Her brother, Cadmus, left his home country and wandered about the world to bring her back. He did not find her. When in Bœotia, he had a fight with a fierce dragon. He killed the monster and planted its teeth into the earth. Armed men grew out of the earth who, in an atrocious battle, killed each other, with the exception of five with whose help Cadmus built Thebes. Ovid, in his "Metamorphoses," speaks of these dragon's teeth as of "populi incrementa futuri" and "mortalia semina." Those teeth which Cadmus did not sow came to the possession of Æetes, King of Colchis, and one of the tasks he enjoined on Jason was to sow these teeth and slay the armed warriors that rose therefrom. The phrase, to sow the dragon's teeth,

is still used in the sense of: to foment contentions, to stir up war.

According to some accounts, the teeth of the dragon whom Cadmus slew were sown by the goddess Athena, and it was also Athena who gave the rest of the teeth to Ætes.

The loss of teeth in dreams. Practically the entire earth over the dream of losing a tooth is interpreted as a prophecy of the impending death of a relative. In Japan, if one dreams of having loose teeth or the teeth extracted, it signifies that a member of the family will die soon; if it was an upper tooth, the dreamer will lose a relative elder than he; if it was a lower tooth, the one to die is younger than the dreamer. The Talmud tells that Raba once dreamed that his teeth dropped out; this was taken as an indication that his children were doomed to die. In England, to lose a tooth is to lose a friend. Rose, in his "Folklore Scraps," tells of a man who dreamed of losing one and who was somewhat apprehensive that the omen might be effective. In Thuringia, it all depends upon how the tooth was lost in the dream; if there was no pain accompanying the loss, death will be painless, if it was combined with pain, death is bound to be painful. In the Allgäu, the loss of a tooth predicts the dreamer's own death.

I wish to emphasize that the "interpretations" given in the so-called dream books are usually arbitrary elaborations of their authors and have nothing to do with folklore. They borrow occasionally from folklore, but most of their "statements" are inventions of their own fancy. I have, therefore, not made use of any of those dream books.

A Riddle. The negroes of South Carolina have this riddle: Twenty white horses in a row. When one star', all begin one time.—Answer: The teeth.

(Variants: I. Lots o' white horses in a row, when one start, all start.

II. Twenty-fo' horses set upon a bridge.—Answer: Teet' in yer gum.

III. Twenty-four horses in stall, one red man whipping hard.

IV. White horses sit on a red hill. An' ev'y time dey gallup, dey gallup.)

The Teeth and Married Life.

In Persia, a man or woman whose teeth are far apart will marry twice.

It is bad luck for two persons with false teeth to marry.

If your teeth decay at the lower edge, you will marry a widower.

If your teeth decay at the side, you will marry well.

If your teeth decay at the top, you will be sure to be an old maid.

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GLOSSARY

Alain de Lille, or Alanus de Insulis, a French sage, surnamed "The Universal Doctor"; 1114-1203.

Albertus Magnus, a medieval philosopher, theologian, and scholar; founder of scholasticism; 1200-1280.

Auro dentes iuncti, teeth united with gold.

Anthropotherapeutics, the use of human organs and secretions in the treatment of diseases.

Apuleius, a Roman satirist, philosopher and traveler of the second century; author of The Golden Ass, Apologia, etc.

Avesta, or Zend-Avesta, a collection of all documents containing the sacred writings of the religion of Zoroaster; it is still the "Bible" and the prayer-book of the Parsees.

Avicenna, an Arab physician and philosopher; 980-1037. His Canon of Medicine was the guide to medical study in every university in Europe from the twelfth to the seventeenth century.

Badbh, or Badb, in Irish myth, a fury who arouses the fighting spirit; the goddess of battle.

Banshee, in Irish and Scotch folklore, a fairy visitant, often in the shape of an old woman, whose wailing under the window of a house foretold death.

Bantu, the great family of Negroid tribes occupying equatorial and southern Africa.

Calabash, a vessel made of the hard shell of the fruit of the common gourd, Lagenaria vulgaris, or of the calabash tree, Crescentia cujete.

Canine tooth, the tooth situated between the incisor and bicuspid teeth; an eyetooth, or the corresponding tooth in the lower jaw.

Capybara, a large stoutly built South-American rodent frequenting the borders of lakes and rivers, about four feet long, with coarse dark-brown fur, webbed feet and a stumpy tail.

Catullus, Caius Valerius, a lyric poet of ancient Rome; 87-54 B.C.

Cauterization, the burning or searing of a wound with a caustic drug or with a heated metal.

Celsus, Aurelius Cornelius, a Roman medical writer of the first century.

Cervantes Saavedra, Miguel de, a famous Spanish writer, author of Don Quixote; 1547-1616.

Chosroes the Great, king of Persia; conquered Yemen and Armenia; died 579.

Chrysodontoscopia, the "science" of the golden tooth.

Claudius, Matthias, the "Messenger of Wandsbeck," a German poet; 1740-1815.

Cossack, "a mixed race of Malo-Russians, Poles, Tartars, Great Russians, and other adventurers, who occupied the wild and thinly peopled territories lying to the south of Russia and Poland" (W. R. Morfill, Russia, G. P. Putnam's Sons, New York, 1890, p. 120).

Cuneiform, wedge-shaped; applied especially to the wedge-shaped or arrowheaded characters of ancient inscriptions of Persia and Assyria.

Deciduous Teeth, milk teeth.

De Coster, Charles Theodore Henri, a Belgian writer, author of Tyll Ulenspiegel; 1827-1879.

Derivative, having the quality of drawing or diverting morbid action from one part to another.

Diodorus, a Greek historian of the first century B.C.

Dioscorides, Pedanius, a Greek botanist of the first and second centuries.

Donar, a Germanic deity worshiped as the god of thunder and warlike strength, as patron of agriculture and of marriage. He is the same as the Scandinavian Thor.

Feast of the Tabernacles, an annual autumnal festival of the Jews commemorating the dwelling in tents in the wilderness.

Fellah, a peasant or cultivator in Egypt, Syria and other Arabic-speaking countries.

Galen, Claudius, a Greek medical writer and philosopher; 131-201.

Gall, Franz Joseph, a German physician and criminologist, the founder of phrenology; 1758-1828.

Gemara, the commentary of the Talmud.

Gullintanni, the one with the golden tooth.

Hakluyt, Richard, English historian and geographer; 1552-1616.

Hieroglyphic, the picture writing of the ancient Egyptians.

Hippocrates, famous Greek physician who lived in the fifth and fourth centuries B.C.; named the Father of Medicine.

Infibulation, the attachment of a ring or lock to the sexual organs, to prevent copulation.

Inspissate, thickened, given greater consistency by boiling or evaporation.

Langobardians, or Longobardians, or Lombards, a Teutonic tribe

which originally dwelt on the Elbe, later on the Danube and invaded Italy in 568. They established the Lombard kingdom in the valley of the Po, which was overthrown by Charlemagne in 774.

Laura, the lady whose praises are sung by Petrarch in his famous sonnets. She is identified with Laura de Noves, an Avignonese lady who was already married to Hughes de Sade when the poet first saw her.

Lavater, Johann Kaspar, a Swiss Protestant clergyman and writer on physiognomy; 1741-1801.

Livy (Livius), a Roman historian; 59 B.C.-A.D. 17.

Louvre, a museum of science and art in Paris, containing the most extensive collections of Europe, including priceless paintings, sculptures and antiquities.

Lucian, Greek satirical author; 120-200.

Mahabharata, an ancient Hindu epic or collection of poems, reciting the dynastic wars of the Pandava and Kaurava of northern India, with numerous interpolations of legendary religious, moral, social and scientific dissertations. It is supposed to date from 500 B.C. and ascribed to the mythical author Vyasa.

Maimonides, or Moses ben Maimon, called Rambam, Spanish Jewish Rabbi, philosopher and writer; 1135-1204.

Midrash, the Hebrew Scriptural exegesis made during a period of about 1500 years after the Exile, largely based upon tradition.

Mishna, the traditional doctrine of the Jews as represented chiefly by the decisions of the rabbis before the third century A.D.

Mogul, one of the Mongol conquerors of India or their descendants.

Odontology, the body of scientific knowledge that relates to the teeth.

Og, the giant king of Bashan conquered by Moses.

Orthodontics, mechanical treatment for correcting irregularity and faulty positions of the teeth.

Pahlavi, the language of western Iran, dating from the third century A.D., the literary language of Persia during the Sassanian dynasty, used for translations, commentaries of the Avesta, and for other theological treatises.

Palometa, or round pompano, a fish of the warm seas, having a high body and the spinous dorsal fin replaced by free spines.

Paracelsus, pseudonym of Theophrastus Bombastus von Hohenheim, a Swiss medical philosopher; 1493-1541.

Parsees, the adherents of the old Persian religion, whose ancestors

fled from Persia to India about the eighth century on account of Mohammedan persecutions; also used for the people of Persia collectively.

Petrarch, Francesco, a great Italian scholar and lyric poet, initiator of the humanistic movement for the return to the classics; 1304-1374.

Pharmacopoeia, a book, published by authority, containing the formulas and methods for the preparation of medicines. The United States Pharmacopoeia is revised every ten years by a representative body of physicians and pharmacists.

Phytotherapeutics, the use of plants in the treatments of diseases.

Piraya, or serrasalmo, a caribe of tropical South-American rivers.

Pliny, Gaius Plinius Secundus, a Roman naturalist who perished in the destruction of Pompeii; 23-79.

Prognathism, forward projection of the jaws.

Rashi, pseudonym for Salomon ben Isaac, a rabbinic scholar and commentator of Troyes, France; 1040-1105.

Roman Martyrology, a list of martyrs and other saints of the Roman Catholic Church, with brief biographies, following the ordes of their anniversaries.

Runic, pertaining to the runes, or characters of the alphabet formerly in general use by the Teutonic, or Germanic peoples.

Saturnalian presents, gifts given at the occasion of the annual festival of Saturn held at ancient Rome in mid-December.

St. John's Day, December 27th.

Talmud, the body of Jewish civil and canonical law consisting of the combined Mishna, or text, and Gemara, or commentary.

Unicorn, a fabulous animal with one horn.

Wieland, Christoph Martin, a German poet and novelist; 1733-1813.

Zootherapeutics, the use of animals, their organs or secretions in the treatment of diseases.